

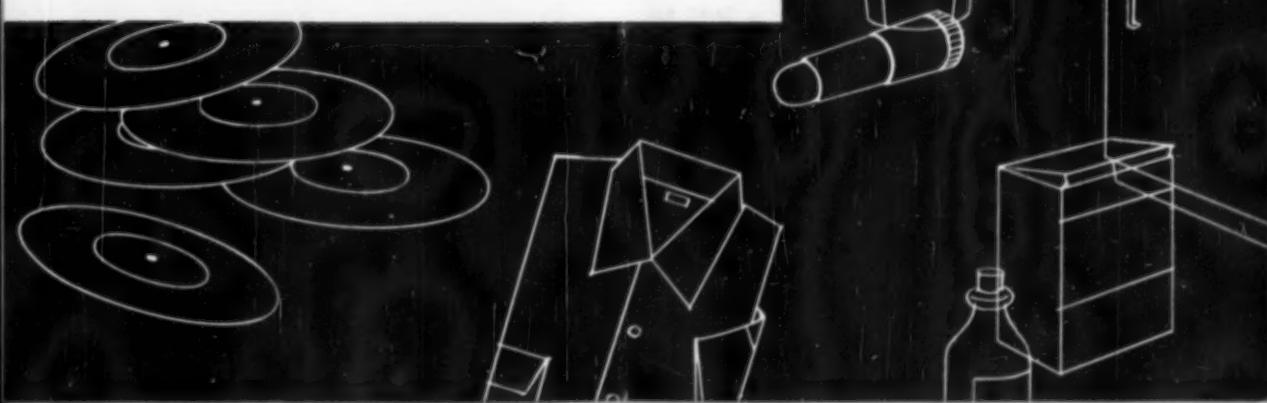
Consumers' Research

BULLETIN

MARCH • 1955

Eight 1955 Automobiles	5
Automatic Dishwashers	13
Diapers	18
Television Receivers	23
Synthetic Detergents	27
Air Conditioning - I	29
Stereoscopic Photography	33
Printed Electronic Circuits	37

COMPLETE CONTENTS ON INSIDE FRONT COVER



Consumers' Research Bulletin

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VOL. 35 • NO. 3

Eight 1955 Automobiles.....	5
Five Automatic Dishwashers.....	13
Baby's Diapers.....	18
Diaper Pins.....	22
1955 Television Receivers.....	23
Synthetic Detergents.....	27
Central Air Conditioning for the Home—I.....	29
Stereoscopic Photography.....	33
Speed Reducer for Electric Drills.....	36
Printed Electronic Circuits.....	37

Miscellaneous

Apple Parer, Corer, and Slicer.....	12
Audak Stylus-Disk.....	17
Contributions to CR Not Taxable.....	17
"Water-Conditioning" Gadgets.....	26
Source for Low-Priced Photostats.....	38

Features

Off the Editor's Chest.....	2
The Consumers' Observation Post.....	3
Brief Cumulative Index.....	35
Ratings of Motion Pictures.....	39
Phonograph Records—Walter F. Grueninger.....	43

Consumers' Research functions to provide unbiased information on goods bought by ultimate consumers. For their benefit (not for business or industry) and solely with the funds they provide, CR carries on tests and research on a wide variety of goods, materials, and appliances, and publishes the findings in *CR BULLETIN*. Consumers' Research is a non-profit institution, and is organized and operates as a scientific, technical, and educational organization.

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OFF THE EDITOR'S CHEST

WHEN products are plentiful and consumers have money to buy if they choose, prices cannot be kept artificially high even by resale price maintenance laws which sanction the so-called "fair trade" contracts. Price fixing has been legalized by "fair trade" acts in many states and held constitutional by various state courts and the U.S. Supreme Court. Recently the Federal Trade Commission supported this line of decisions by ruling that the Eastman Kodak Company may enter into fair trade contracts with retailers to fix prices even though the Justice Department had just ended price fixing on Eastman color film by a consent decree.

In spite of legal victories, however, the future of "fair trade" activities is dark, for they will probably be nullified by the basic economic law of supply and demand. Consumers have indicated they simply will not pay prices fixed by manufacturers in an effort to keep in business merchants whose operating costs are too high. Discount houses are flourishing all over the country, and department stores which sell appliances are cutting prices to hold their customers.

Realistic appraisal of the market was indicated by the action of two big manufacturers recently when General Electric discontinued suggested store prices for large household appliances, and RCA Victor drastically cut prices of LP records, followed by other record companies.

Mass production must find its counterpart in marketing to move the extensive variety of products in a volume corresponding to the rate at which they come off the production line. When prices are too high, the sheer weight of numbers that must be disposed of brings prices down.

Consumers have won a major victory by their refusal to purchase at artificially fixed prices and by their patronage of outlets which have sold products at prices on more realistic levels. No doubt the coming year will see an increase in consumer purchases if the present downward trend of prices continues. It should be a good time to stock up on household needs.

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It will be advantageous if you will, whenever possible, send prompt notice of change of address at least 5 weeks before it is to take effect, accompanying your notice with statement of your old address with name in full. At least a month's notice must be given in any case. This rule, however, regarding long advance notice does not apply to military personnel. CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.

Symbols used to indicate sources of data and bases of ratings: A—recommended on basis of quality; AA—regarded as worthy of highest recommendation; B—intermediate with respect to quality; C—not recommended on basis of quality; cr—information from Consumers' Research's own tests or investigations; 1, 2, 3—relative prices, 1 being low, 3 high. Note that price and quality are completely differentiated in CR's listings; a quality judgment is independent of price; 54, 55—year in which test was made or information obtained or organized by the staff of Consumers' Research.

The Consumers' Observation Post

CHILDREN'S MINOR AILMENTS often receive too much rather than too little medical attention these days. In an address before the American Medical Association's convention last year, Dr. Robert B. Lawson, head of the pediatrics department, University of Miami, School of Medicine, urged less doctoring for children, pointing out that when the baby is "off his feed" there is often nothing to worry about and he does not necessarily need tonics or elaborate vitamin mixtures. Dr. Lawson recognized the need for an occasional tonsillectomy, but suggested that all too often tonsils were removed for no particular reason. He disapproved of the overuse of antibiotics and suggested that the test of a good physician might well be his willingness to let nature take its course in certain cases.

THE NEW LOOK in kitchen equipment is giving some dealers the jitters. Built-in wall ovens and surface unit ranges, along with the cabinet-like refrigerator-freezer combinations that hang on or fit into the wall at shoulder level are the latest thing in "dream-kitchen" equipment. Installing these appliances, however, calls for the services of expert electricians, plumbers, and carpenters, and the appliance dealers are somewhat unhappy over the installation problems involved. It is too early to anticipate what housewives will do, but the dealers are wondering uneasily what will happen when the lady of the household wants her kitchen done over with new kinds of appliances.

UPHOLSTERED FURNITURE is a source of "complaint trouble" both from consumers and retailers. According to Retailing Daily, the chief difficulty is the use of fabrics of unsatisfactory quality, particularly on "promotional price" items. There is demand for minimum standards of construction and performance of upholstery fabrics from a number of quarters, and the suggestion has been advanced that fabric houses should not introduce new fibers and materials until the qualities of strength and weakness have been carefully evaluated. One furniture manufacturer is reported to have complained that some new metallic fabrics have flashy appeal but less "wearability" than other fabrics. The living room sofa that can be converted into a bed at night is a particular problem because its dual function increases the wear considerably over that received by the conventional living room sofa in most homes. It appears, too, that all types of upholstered living room pieces have received increased wear since the arrival of television. The arms of chairs and sofas, which get the most consumer use, are considered particularly vulnerable.

THE DANGERS OF CIGARETTE SMOKING continue to be a topic of research among medical scientists. The British Medical Journal not long ago reported the results of a study carried out in the Department of Chemistry, London University, indicating that a cancer-producing chemical had been identified in the tar of cigarette smoke. The researchers found that both tobacco and cigarette paper yielded benzpyrene when smoked but indicated that the action of this chemical on the respiratory tract had not yet been established.

THE MODERN SEPTIC TANK is a necessary convenience to those living beyond the limits of municipal sewage disposal systems. It is effective and adequate but may sometimes require pampering for best results. Specialists, such as Gus Carnes, in a New Jersey Experiment Station publication, note that chemical tank cleaners may do more harm than good. The

normal use of household chemicals such as drain solvents and cleaning or disinfecting solutions, according to Mr. Carnes, will cause no adverse effect on the operation of a septic tank. Disposal of diaper liners and similar materials, however, increases the work to be done by septic tanks since these items do not disintegrate rapidly. It is his opinion that the use of automatic washers and electric dishwashers will not cause any difficulty in the operation of septic tanks of the proper size. Garbage grinders ("disposal" units), on the other hand, definitely require increased septic tank capacity.

* * *

THE HOME DECORATOR who decides to finish painting when some work has already been done by a professional painter may run into color trouble. One CR subscriber reports that several rooms in his home were painted by a contractor from a selection of colors, thought to be Super Kem-Tone, for the walls. Sometime after the job was completed, he decided to do another room himself but was unable to match the color. He discovered that the wall paint was not Super Kem-Tone but Quali-Kote, manufactured in a different color series and available, in gallon lots, to painting contractors, and only for their use, since they prefer products that are not marketed to consumers. He was finally able to persuade the contractor to get it for him, but noted that as a dyed-in-the-wool do-it-yourselfer he resented this sort of setup of paint brands by manufacturers.

* * *

THAT NEW CHEMICAL, monosodium glutamate, which is now being added to canned soups, stews, a wide variety of "made dishes," and even crackers, for the avowed purpose of heightening their natural flavor, is supposed to be entirely harmless. In a recent issue of the Journal of the American Medical Association, however, one physician reports this chemical was the offending agent which caused serious allergy with symptoms resembling those due to gall bladder disease including epigastric fullness, belching, distention and upper abdominal discomfort that was quite marked, in a mother and her son. They would become sick within half an hour after eating meals of excellent food prepared at home, as well as those eaten at fine restaurants. The difficulty was simply disposed of when the monosodium glutamate was recognized as the causative agent and avoided thereafter.

* * *

THE NEW RESIN-COATED FABRICS that look like leather are quite attractive when new and are growing in popularity. Whether consumers will be pleased with their performance in the wide variety of uses to which they are being put depends on how satisfactorily they can be cleaned. Some excellent advice has been issued by the National Institute of Cleaning and Dyeing indicating that imitation leather garments that are not lined can be wet-cleaned, but not dry-cleaned, by the professional cleaner. Those which are lined may or may not clean satisfactorily, and the cleaner will accept such garments at the consumer's risk. Dresses made of dry-cleanable fabrics and trimmed with simulated leather can usually be worn only until they become soiled.

* * *

SEVERAL PRODUCTS SOLD AS "BUST DEVELOPERS" have been the subject of federal action. Kurvon, along with La Contour and Charm-On have been taken off the market as the result of proceedings by the Fraud Division of the Post Office Department. The first two, according to the Bureau of Investigation of the American Medical Association, were essentially galega (a plant extract) in a tricalcium phosphate base, flavored with anise; Charm-On was galega, vitamin B₁, and iron. The Journal reports that the various distributing companies involved executed affidavits of discontinuance of business so that the Post Office was spared the use of taxpayers' money to hold hearings. The flamboyant advertising that was widely used to promote these products produced many inquiries to which the A.M.A. Journal replied

(The continuation of this section is on page 41)

Eight 1955 Automobiles

Buick

Chevrolet

Ford

Mercury

Oldsmobile

Plymouth

Dodge



Oldsmobile Super 88

Buick Roadmaster

A

Buick Roadmaster. \$3274 (factory list price including \$237 federal excise tax). *Dynaflow* and power steering are standard equipment and included in the price above. Radio, \$92.50; heater, \$82; power brakes, \$38.70.

A well-appointed, well-constructed car, but one that in CR's opinion would be much more desirable if it were designed for better riding qualities on rough roads.

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: *Dynaflow* and power steering (standard equipment); radio, heater, power seat, power brakes.

Acceleration times from 0 to 30 m.p.h., 5.7 sec.; from 0 to 60 m.p.h., 13.6 sec.; from 20 to 50 m.p.h., 6.9 sec.; from 40 to 60 m.p.h., 6.3 sec. All very good.

Gasoline mileage under test conditions: at 50 m.p.h., 19 m.p.g., very good for a car of this size and weight.

Riding comfort was very good on smooth roads, but there was noticeable pitching and bounce on rough roads. The rear end "bottomed" on bad bumps. The relatively poor riding quality on rough roads is believed characteristic of the coil-type rear suspension. (It is not clear why *Buick* has continued to use this type of suspension, dropped by *Oldsmobile* in 1951.) Power steering was very good except that the design required too many turns of the steering wheel.

Speedometer error: at indicated speed of 20 m.p.h., actual speed was 17 m.p.h.; at 35 m.p.h., 31; at 50 m.p.h., 45; at 60 m.p.h., 55. **Odometer** was inaccurate by about 2% (100 miles would be shown as 102 miles).

BUICK ROADMASTER SPECIFICATIONS

Engine

8 cylinders in "V" arrangement, overhead valves
Bore, 4 in. stroke, 3.2 in.
Piston displacement: 322 cu. in.
Brake horsepower (rated): 236 at 4600 rpm.
Taxable horsepower: 51.2
Compression ratio: 9.0 to 1 (requires premium gasoline)
Cylinder head: cast iron
Automatic choke
Crankcase oil capacity: 6 qt.
Oil filter: full-flow type
Cooling system (pressure type): 20 qt. with heater

Chassis, etc.

Wheelbase: 127 in.
Over-all length: 216 in.
Width: 80 in.
Height: 62.7 in.
Gear ratio: 3.4 to 1
Engine revolutions per mile: 2460
Tires: 8.00 x 15 tubeless (overloaded)
Brake area: 219 sq. in.
Brake factor: 44 (good)
Frame: channel side members, channel "X" center cross member
Minimum road clearance: 6.8 in.
Turning diameter: 43 ft.
Front shoulder room: 59.5 in.
Rear shoulder room: 58.5 in.
Steering factor: 5.8 with power steering (high)

Other details

Battery: 12-volt 60-amp.-hr.
Gasoline tank: 19 gal.
Windshield wipers: vacuum type
Shipping weight: 4280 lb.
Curb weight of car tested: 4525 lb., 54% on front (average)

OBSERVATIONS AND CONCLUSIONS

This car now has one of the highest (9 to 1) compression ratios of any American stock cars (the other is *Cadillac*). Rated horsepower has been increased from 200 to 236, but this, plus this year's variant of the *Dynaflow* transmission, has not resulted in any significant improvement in acceleration in the 0 to 30 m.p.h. range. Acceleration, however, was appreciably better this year in the 20 to 50 and 40 to 60 m.p.h. ranges. Visibility, front and rear, good, except that rear fenders were not visible to the driver. Headroom and leg room, front and rear, were adequate, but there was some danger of the heads of tall rear seat passengers striking the top of the rear metal window frame if the car should be started suddenly or pass over a bad bump. For other comments, see *Buick Special* in the February 1955 BULLETIN.

Considered a good car, combining ample power with good gasoline economy. May require premium gasoline in some areas and under some conditions of use.

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: Heater, turn signals, back-up lights.

Acceleration times from 0 to 60 m.p.h., 12.6 sec.; from 20 to 50 m.p.h., 10.5 sec.; from 40 to 60 m.p.h., 7.2 sec. (good).

Gasoline mileage under test conditions: at 50 m.p.h., 19.7 m.p.g. (good).

Riding comfort was good. The car handled and held the road very well; steering was precise, and steering effort required was about normal.

Speedometer error: at indicated speed of 20 m.p.h., correct; at 35 m.p.h., actual speed was 34; at 50 m.p.h., 48; at 60 m.p.h., 57.5. **Odometer** was inaccurate by about 2% (100 miles would be shown as 102 miles).

OBSERVATIONS AND CONCLUSIONS

For comments, see *Chevrolet V-8 Bel Air Powerglide* in the February 1955 BULLETIN, which are applicable to this car.

Chevrolet 210 V-8

A

Chevrolet 210 V-8. \$1893 (factory list price including federal excise tax of \$141).

CHEVROLET 210 V-8 SPECIFICATIONS

Engine

8 cylinders in "V" arrangement
Bore, 3.75 in.; stroke, 3 in.
Piston displacement: 265 cu. in.
Brake horsepower (rated): 162 at 4400 rpm.
Taxable horsepower: 45
Compression ratio: 8.0 to 1
Cylinder head: cast alloy iron
Automatic choke
Crankcase oil capacity: 4 qt.
Oil filter: partial-flow type is optional equipment
Cooling system (pressure type): 17 qt. with heater

Chassis, etc.

Wheelbase: 115 in.
Over-all length: 195.5 in.
Width: 74 in.
Height: 60.5 in.
Gear ratio: 3.7 to 1
Engine revolutions per mile: 2790
Tires: 6.70 x 15 tubeless (adequate)
Brake area: 158 sq. in.
Brake factor: 40.5 (average)
Frame: Box side members, channel rear cross member; front cross member has bottom plate welded on
Minimum road clearance: 6.5 in.
Turning diameter: 38 ft.
Front shoulder room: 56.75 in.
Rear shoulder room: 56.5 in.
Steering factor: 4.5

Other details

Battery: 12-volt 50-amp.-hr.
Gasoline tank: 16 gal.
Windshield wipers: vacuum type
Shipping weight: 3150 lb.
Curb weight of car tested: 2-door club coupe, 3280 lb., 52% on front (less than average, desirable)

Ford Mainline 6

FORD MAINLINE 6 SPECIFICATIONS

Engine

6 cylinders, overhead valves
Bore, 3.69 in.; stroke, 3.60 in.
Piston displacement: 223 cu. in.
Brake horsepower (rated): 120 at 4000 rpm.
Taxable horsepower: 31.5
Compression ratio: 7.5 to 1
Cylinder head: cast iron
Manual choke
Crankcase oil capacity: 5 qt.
Oil filter: full-flow type optional
Cooling system (pressure type): 17 qt. with heater

Chassis, etc.

Wheelbase: 115.5 in.
Over-all length: 198.5 in.
Width: 76 in.
Height: 61 in.
Gear ratio: 3.89 to 1 (4.11 to 1 optional)
Engine revolutions per mile: 2910 (3070)
Tires: 6.70 x 15 tubeless (adequate)
Brake area: 192 sq. in.
Brake factor: 50 (very good)
Frame: Box section side rails, 5 cross members
Minimum road clearance: 6.8 in.
Turning diameter: 41 ft.
Front shoulder room: 57 in.
Rear shoulder room: 57 in.
Steering factor: 4.5

Other details

Battery: 6-volt 90-amp.-hr.
Gasoline tank: 17 gal.
Windshield wipers: vacuum type
Shipping weight: 3105 lb.
Curb weight of car tested: 3260 lb. (2-door sedan), 56.5% on front (average)

Ford Mainline 6. \$1727 delivered at factory for 4-door sedan (including federal excise tax of \$127).

Ford's lowest-priced line, judged a good car for those who desire transportation primarily, with good economy.

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: 2-door sedan with heater, oil bath air cleaner, and oil filter.

Acceleration times from 0 to 60 m.p.h., 19.9 sec.; from 20 to 50 m.p.h., 13.4 sec.; from 40 to 60 m.p.h., 10.7 sec. These figures are approximately the same as obtained with the *Chevrolet Six*, which had the same gear ratio of 4.11 to 1.

Gasoline mileage under test conditions: at 50 m.p.h., 18.7 m.p.g. (good).

Riding comfort: Like that of the *Ford V-8*, fairly good but not outstanding. The steering, however, was not precise, possibly due to too much play in the steering mechanism of the car tested.

Speedometer errors: at indicated speed of 20 m.p.h., actual speed was 19 m.p.h.; at 35 m.p.h., 33; at 50 m.p.h., 45.5; at 60 m.p.h., 54.5. **Odometer** was inaccurate by about 4% (100 miles would be shown as 104 miles).

OBSERVATIONS AND CONCLUSIONS

See the *Ford V-8 Customline* in the February 1955 BULLETIN, which is similar except for the engine.

Mercury Monterey Merc-O-Matic

A

Mercury Monterey Merc-O-Matic. \$2555 (factory list price including federal excise tax of \$180). Radio, \$96; heater, \$72.

A good car, but it does not appear to offer enough over the Ford V-8 Customline Fordomatic to be worth the extra price of \$455. Essentially a "de luxe" Ford.

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: Radio, heater, *Merc-O-Matic* transmission.

Acceleration times from 0 to 30 m.p.h., 4.9 sec.; from 0 to 60 m.p.h., 12.9 sec.; from 20 to 50 m.p.h., 8.3 sec.; from 40 to 60 m.p.h., 6.4 sec. All very good, and exceptionally good in the important 40 to 60 m.p.h. range.

Gasoline mileage under test conditions: at 50 m.p.h., 17.1 m.p.g., which was better than that obtained with the *Ford V-8 Fordomatic*.

Riding comfort was good, in general. There was moderate road shock. General roadability and stability on curves was very good. The steering was precise, and steering effort was low to moderate.

Speedometer errors: at indicated speed of 20 m.p.h., actual speed was 19.5 m.p.h.; at 35 m.p.h., 32.5; at 50 m.p.h., 45; at 60 m.p.h., 53.5; at 70 m.p.h., 63. **Odometer** was inaccurate by about 3% (100 miles would be shown as 103 miles).

OBSERVATIONS AND CONCLUSIONS

This year the rated horsepower has been raised from

MERCURY MONTEREY MERC-O-MATIC SPECIFICATIONS

Engine

8 cylinders in "V" arrangement, overhead valves
Bore, 3.75 in.; stroke, 3.30 in.
Piston displacement: 292 cu. in.
Brake horsepower (rated): 188 at 4400 rpm.¹
Taxable horsepower: 45
Compression ratio: 7.6 to 1
Cylinder head: cast iron
Automatic choke
Crankcase oil capacity: 5 qt.
Oil filter: full-flow type
Cooling system (pressure type): 20 qt. with heater

Chassis, etc.

Wheelbase: 119 in.
Over-all length: 206 in.
Width: 76.5 in.
Height: 61.0 in.
Gear ratio: 3.15 to 1 (3.54 to 1 optional, 3.73 to 1 standard)
Engine revolutions per mile: 2320 (2605)
Tires: 7.10 x 15 tubeless
Brake area: 191 sq. in.
Brake factor: 4.2
Frame: Box section side rails, 5 cross members
Minimum road clearance: 6.5 in.
Turning diameter: 42.5 ft.
Front shoulder room: 57 in.
Rear shoulder room: 57 in.
Steering factor: 4.7

Other details

Battery: 6-volt 100-amp.-hr.
Gasoline tank: 18 gal.
Windshield wipers: vacuum type
Shipping weight: 3530 lb.
Curb weight of car tested: 3805 lb., 56% on front (average)

¹Engine with 8.5 to 1 compression ratio rated at 198 hp. available at extra cost for *Merc-O-Matic* models.

161 to 188, and this year's *Mercury* gave much better acceleration than last year's model in the 20 to 50 and 40 to 60 m.p.h. ranges. Dual exhausts (one for each manifold) are standard equipment on the *Montclair* and *Monterey*. The brake area, though increased from 159 sq. in. to 191 sq. in., is only as much as is provided on the 1955 *Ford V-8*, which had very good brakes. The instrument panel has been completely redesigned with the instruments in a fan-shaped cluster. All the controls were identified and all were illuminated except wiper and lights. The heater's temperature and blower controls were separated by the instrument cluster; a simple integrated system, which some makers seem to find it difficult to provide, would be preferable. The fresh-air inlets were located low at the front (undesirable). The dome light and two "courtesy lights" illuminating the front floor were operated by the opening of either front door; also by a switch under the dash. Large transmission hump in the floor of the front compartment. The desirable ammeter and oil pressure gauge have been retained and are much preferable to the indicating lights used on

Ford and a number of other makes. Visibility, front and rear, good (except that rear fenders could not be seen by the driver). Some reflection in the windshield, of chrome trim on the instrument panel. Headroom and leg room were adequate both front and rear. Front door handles badly located and could be accidentally opened by a person's knee (undesirable from a safety standpoint). The new *Merc-O-Matic* transmission operated satisfactorily and smoothly. It now permits kicking down into low gear whenever the car speed is below 20 m.p.h. or when the car is at rest with selector in "drive" position. Trunk space was adequate, but high lip made loading and unloading somewhat difficult. Robe cord hung directly over the rear ash tray on the back of the front seat; at night, with poor visibility, the cord could easily be burned.

Oldsmobile Super 88 Hydra-Matic

A

Oldsmobile Super 88 Hydra-Matic. \$2636 delivered at factory (including federal excise tax of \$180). Radio, \$101; heater \$80; power steering, \$108; power brakes, \$40.

This car is considered easily the best of all cars tested to date, in ease of handling, riding comfort, quietness of operation, and roadability.

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: *Hydra-Matic*, power steering, power brakes, radio, and heater.

Acceleration times from 0 to 30 m.p.h., 4.3 sec.; from 0 to 60 m.p.h., 14.9 sec.; from 20 to 50 m.p.h., 8.8 sec.; from 40 to 60 m.p.h., 8.4 sec. While not quite so good as the *Chevrolet V-8* and *Ford V-8* cars with automatic transmissions (both about 600 lb. lighter), the acceleration of this car was more than ample for anyone.

Gasoline mileage under test conditions: at 50 m.p.h., 16.7 m.p.g. (about average).

Riding comfort was very good under all conditions. Cornering ability at high speeds was good. Power steering was satisfactory.

Speedometer error: at indicated speeds of 20 m.p.h., actual speed was 18.5 m.p.h.; at 35 m.p.h., 31; at 50 m.p.h., 46. **Odometer** was inaccurate by about 4% (100 miles would be shown as 104 miles).

OBSERVATIONS AND CONCLUSIONS

Although the rated horsepower has been raised from 185 to 202, and the compression ratio increased from 8.25 to 1 to 8.5 to 1, the acceleration performance of this car, which was more than ample for any normal use, was not quite as good as that of the 1954 model tested. Gasoline economy at 50 m.p.h. was also not as good as that of the 1954 model (16.7 m.p.g. compared to 18 m.p.g.). The riding qualities, however, were much improved. Engine was exceptionally quiet and wind noise was low even at high speeds. The instrument panel was well arranged, and the controls were identified, but not illuminated as they

should be for night driving. The top of the panel was padded and covered with artificial leather (such padding is most desirable from a safety standpoint). The heater was adequate and relatively simple to operate, but the defroster fan was very noisy at its high speed setting. The fresh-air inlet was at the cowl (desirable). The *Hydra-Matic* indicator quadrant is incorporated in the dash; it is electrically operated and functions only when the ignition is turned on. The transmission hump in the floor of the front compartment was wide but of medium height and therefore less objectionable than on some cars. The dome light was operated by opening of either front door. Two courtesy lights, operated by a switch under the dash, light the floor of front compartment. The power brakes operated satisfactorily. Visibility to front and rear was good (all four fenders can be seen by the driver—an aid in parking). Leg room, front and rear, adequate. Headroom, front, adequate, but inadequate in the rear, and there was some danger of heads of tall rear seat passengers striking the top of the metal rear window frame if the car should be

OLDSMOBILE SUPER 88 HYDRA-MATIC SPECIFICATIONS

Engine

8 cylinders in "V" arrangement, valve-in-head
Bore, 3-7/8 in.; stroke, 3-7/16 in.
Piston displacement: 324.3 cu. in.
Brake horsepower (rated): 202 at 4000 rpm.
Taxable horsepower: 48
Compression ratio: 8.5 to 1 (requires premium gasoline)
Cylinder head: cast iron
Automatic choke
Crankcase oil capacity: 5 qt.
Oil filter: full-flow type
Cooling system (pressure type): 21.5 qt. with heater

Chassis, etc.

Wheelbase: 122 in.
Over-all length: 203.5 in.
Width: 78 in.
Height: 60.5 in.
Gear ratio: 3.23 to 1 (3.42 to 1 with standard transmission)
Engine revolutions per mile: 2330 (2470 with standard transmission)
Tires: 7.60 x 15 tubeless (overloaded)
Brake area: 192 sq. in.
Brake factor: 41.5
Frame: Channel section side rails, I beam "X" member, 5 cross members
Minimum road clearance: 6.25 in.
Turning diameter: 42 ft.
Front shoulder room: 58 in.
Rear shoulder room: 56.75 in.
Steering factor: 4.8

Other details

Battery: 12-volt 60-amp.-hr.
Gasoline tank: 20 gal.
Windshield wipers: vacuum type
Shipping weight: 3855 lb. (3760 lb. with standard transmission)
Curb weight of car tested: 4135 lb., 55.5% on front (average)

started up suddenly or pass over a bad bump. The trunk space was adequate and lighted, as is desirable, when the lid was in the raised position. A sticker inside the trunk gave instructions for the proper method of using the jack. The hood ornament had three sharp points directed forward, a design that is considered to present a quite needless hazard. Large tail lights protruded almost as far as the working face of the bumper and so are more than normally likely to be easily broken or damaged.

Plymouth Savoy V-8

A

Plymouth Savoy V-8. \$1958 (factory list price including federal excise tax of \$148).

With the standard rear axle ratio, this car would be judged preferable to the Plymouth 6.

CR'S FINDINGS ON ROAD TESTS

Acceleration times from 0 to 60 m.p.h., 15.8 sec.; from 20 to 50 m.p.h., 10.6 sec.; from 40 to 60 m.p.h., 7.5

sec. Good, and about the same as the *Chevrolet V-8*; however, test car was equipped with 4.1 to 1 rear axle ratio; the standard 3.73 to 1 ratio would not give as good results.

Gasoline mileage under test conditions: at 50 m.p.h., 17.1 m.p.g. (with standard 3.73 to 1 rear axle ratio, should give about 19 m.p.g.).

Riding comfort: See *Plymouth Savoy 6*. Steering on this car, while precise, was somewhat slow (required too many turns of steering wheel).

Speedometer error: at indicated speed of 35 m.p.h., actual speed was 34 m.p.h.; at 50 m.p.h., 47.5; at 60 m.p.h., 58. **Odometer** was inaccurate by about 3% (100 miles would be shown as 103 miles).

OBSERVATIONS AND CONCLUSIONS

This car was equipped with the engine rated at 167 hp. (The 157 hp. engine with which the *Plymouth Belvedere*, reported in the February 1955 BULLETIN, was equipped, is, we understand, being dropped.) The parking brake, which operated on the drive shaft on this and other *Plymouth* cars, was ineffective when used for an emergency stop. Engine noises were very high on this car, possibly due in part to the high gear ratio and lack of sound insulation under

PLYMOUTH SAVOY 6 AND V-8 SPECIFICATIONS

Engine

	Six	V-8
<i>Cylinders:</i>	6	8
<i>Bore and stroke:</i>	3.25 x 4.63 in.	3.56 x 3.25 in.
<i>Piston displacement:</i>	230 cu. in.	260 cu. in.
<i>Brake horsepower (rated):</i>	117 at 3600 rpm.	167 at 4400 rpm.
<i>Taxable horsepower:</i>	25.4	40.6
<i>Compression ratio:</i>	7.4 to 1	7.6 to 1
<i>Cylinder head:</i>	cast iron	cast iron
<i>Choke:</i>	automatic	automatic
<i>Crankcase oil capacity:</i>	5 qt.	5 qt.
<i>Oil filter:</i>	by-pass type	shunt type
<i>Cooling system:</i>	14 qt. with heater	20 qt. with heater

Chassis, etc.

<i>Wheelbase:</i>	115 in.	
<i>Over-all length:</i>	204 in.	
<i>Width:</i>	75 in.	
<i>Height:</i>	60 in.	
<i>Gear ratio:</i>	3.73 to 1	
<i>Engine revolutions per mile:</i>	2790	
<i>Tires:</i>	6.70 x 15 tubeless	
<i>Brake area:</i>	158 sq. in.	166 sq. in.
<i>Brake factor:</i>	40	41
<i>Frame:</i>	double channel box section side rails, lateral cross members	
<i>Minimum road clearance:</i>	5.4 in.	5.6 in.
<i>Turning diameter:</i>	40 ft.	40.5 ft.
<i>Front shoulder room:</i>		58 in.
<i>Rear shoulder room:</i>		57.8 in.
<i>Steering factor:</i>	4.3	5.1 (high)

Other details

<i>Battery:</i>	6-volt 100-amp.-hr.
<i>Gasoline tank:</i>	17 gal.
<i>Windshield wipers:</i>	electric
<i>Shipping weight:</i>	
<i>Curb weight of car tested:</i>	3155 lb.
	3345 lb. (54% on front)
	3265 lb.
	3585 lb. (53.5% on front)

hood. For other comments, see *Plymouth Belvedere* in the February 1955 BULLETIN.

Plymouth Savoy 6

A

Plymouth Savoy 6. \$1855 (factory list price including federal excise tax of \$141).

A good car for those who prefer "soft" riding qualities, with fair economy and performance.

CR'S FINDINGS ON ROAD TESTS

Acceleration times from 0 to 60 m.p.h., 21.1 sec.; from 20 to 50 m.p.h., 14.0 sec.; from 40 to 60 m.p.h., 11.1 sec. Approximately the same as figures obtained with *Ford 6* with standard transmission.

Gasoline mileage under test conditions: at 50 m.p.h., 18.4 m.p.g.

Riding comfort was good. Ride was softer than that of *Ford* and *Chevrolet*, but car did not handle so well on curves. Steering was faster than that of *Plymouth V-8* (desirable).

Speedometer errors: at indicated speeds of 20 and 35 m.p.h., approximately correct; at 50 m.p.h., actual speed 48; at 60 m.p.h., 56.5. **Odometer** was incorrect by the large amount of 6% (100 miles would be shown as 106 miles).

OBSEVATIONS AND CONCLUSIONS

The rated horsepower has been increased from 100 to 117. The acceleration performance was not as good in the 20 to 50 m.p.h. range and only slightly better in the 40 to 60 m.p.h. range, than the 1954 model. Gasoline mileage, however, was somewhat better. For other comments (other than those referring to engine), see *Plymouth Belvedere V-8* in the February 1955 BULLETIN.

Dodge Custom Royal V-8 PowerFlite

B+

Dodge Custom Royal V-8 PowerFlite. \$2626 (factory list price including federal excise tax of \$182.50). Power steering, \$113; power seat, \$70; radio, \$118; heater, \$78.

*A fairly satisfactory car but appears to be overpriced in relation to the *Chevrolet Bel Air*, which sells at about \$450 less, and to *Buick Special* at about \$200 less.*

CR'S FINDINGS ON ROAD TESTS

Equipment on car tested: *PowerFlite*, power steering, power front seat, radio, and heater, plus minor accessories. The total extra cost for the equipment and accessories amounted to \$707.

Acceleration times from 0 to 30 m.p.h., 4.9 sec.; from 0 to 60 m.p.h., 14.3 sec.; from 20 to 50 m.p.h., 8.1 sec.; from 40 to 60 m.p.h., 7.4 sec. All very good and very close to figures obtained on *Chevrolet* and *Ford V-8's* (which give high acceleration values even

as compared with cars in a considerably higher price class [e.g., *Buick Roadmaster*, *Oldsmobile*]).

Gasoline mileage under test conditions: at 50 m.p.h., 16.8 m.p.g. (about average, so far for V-8's).

Riding comfort was judged good, somewhat softer than most cars tested to date, but there was considerable bounce on uneven roads. On curves, the car did not perform as well as would be desirable. Car tested had power steering, which required too little effort, and is considered unnecessary for this car, as for other light cars.

Speedometer errors: at indicated speed of 20 m.p.h., actual speed was 21 m.p.h.; at 35 m.p.h., approximately correct; at 50 m.p.h., 48. **Odometer** was inaccurate by about 2% (100 miles would be shown as 102 miles).

OBSEVATIONS AND CONCLUSIONS

This car is again essentially a de luxe model of the *Plymouth*, with a 5-in. longer wheelbase, a more powerful engine (rated at 26 hp. higher than the *Plymouth V-8* CR tested), and weighing about 120 lb. more. Its acceleration performance was good but about the same as that of the less powerful *Chevrolet V-8* and *Ford V-8*. As with the *Plymouth*, the engine

DODGE CUSTOM ROYAL V-8 POWERFLITE SPECIFICATIONS

Engine

8 cylinders in "V" arrangement
Bore, 3.63 in.; stroke, 3.256 in.
Piston displacement: 270 cu. in.
Brake horsepower (rated): 183 at 4400 rpm.
Taxable horsepower: 42.2
Compression ratio: 7.6 to 1
Cylinder head: cast iron
Automatic choke
Crankcase oil capacity: 5 qt.
Oil filter: shunt type
Cooling system (pressure type): 20 qt. with heater

Chassis, etc.

Wheelbase: 120 in.
Over-all length: 212 in.
Width: 74.5 in.
Height: 61 in.
Gear ratio: 3.54 to 1 (3.73 to 1 with standard transmission)
Engine revolutions per mile: 2590 (2730)
Tires: 7.10 x 15 tubeless (overloaded)
Brake area: 174 sq. in.
Brake factor: 41
Frame: Double channel box section side rails, lateral cross members
Minimum road clearance: 5 in. (very small)
Turning diameter: 42.3 ft.
Front shoulder room: 58 in.
Rear shoulder room: 58 in.
Steering factor: 3.7 with power steering (good)

Other details

Battery: 6-volt 105-amp.-hr.
Gasoline tank: 17 gal.
Windshield wipers: variable speed electric
Shipping weight: 3510 lb.
Curb weight of car tested: 3785 lb., 57% on front (greater than average, undesirable)

races at high speeds, when kicked down to low gear. This is very disconcerting to the driver accustomed to the quieter and seemingly more effortless functioning of the other makes of automatic transmissions. Shift lever for *PowerFlite* transmission, as on all Chrysler cars, is located on the dash instead of on the steering post. The dome light operated by opening of any door (desirable). Large transmission hump in the floor of the front compartment. The heater controls were unduly complicated, and the blowers were very noisy at high setting. The instrument panel arrangement was satisfactory and much preferable to *Plymouth* (which, having the glove compartment at the center, put the oil pressure and water temperature gauges out of the field of the driver's vision). The controls (with the exception of lights and on-off positions for ignition switch) were identified; a switch-operated courtesy light in the panel provided illumination for locating the controls at night. The turn signals had only one indicating light, and the driver thus has no means of checking that he is signaling correctly. Brakes required above-average pressure to operate. Vision, front and rear, good; headroom at the front was satisfactory; at rear, inadequate for persons above medium height, and heads of rear passengers were too close to the rubber moulding at the top of the rear window frame, a serious hazard in case of a sudden start or passing over a bad bump. The gasoline filler pipe was located on the right side, instead of in the more usual position at the left side. The trunk space was very large but high lip at opening made loading and unloading inconvenient. Minimum road clearance, 5 in. (extremely small; considerable danger of damaging the oil pan on country roads).

Note: Ratings for the cars reported in this BULLETIN must necessarily be regarded as preliminary and tentative; ratings of a more certain character cannot be determined until test data and other information have been studied for all the cars that are to be reported. (Later and more definitive ratings of given makes and models are scheduled to appear in the April

BULLETIN; that BULLETIN will report on all the cars studied, and only at that time can the rating of each make or model be established in proper relation to the various other cars in the same price bracket.)

* * *

For the convenience of our readers, we give below condensations of listings of 1955 cars which appeared in the February 1955 BULLETIN (except *Pontiac*, reported in the January BULLETIN), with their tentative ratings.

Buick Special Dynaflow. \$2449 (factory list price including federal excise tax of \$166). Like last year's model, a satisfactory car for those who desire a heavier car than the *Ford*, *Plymouth*, or *Chevrolet*, and who drive mostly on good, reasonably smooth roads. The *Buick*'s main disadvantages are its relatively poor riding qualities on rough roads and its too-high steering ratio (too many turns of the steering wheel required). A-

Chevrolet V-8 Bel Air Powerglide. \$2184 (factory list price including federal excise tax of \$149). This year the choice between *Chevrolet V-8* and *Ford V-8* is likely to be difficult, for these two cars have much in common in quality and performance. The economy-minded consumer may well prefer the *Chevrolet* for its better gasoline mileage; otherwise, personal preference for details of fittings and appearance will often determine the choice of one make over the other. A

Chevrolet 210 Six with overdrive. \$1902 (factory list price including federal excise tax of \$134). A

Ford V-8 Customline. \$1920 (factory list price including federal excise tax of \$141). Considered a good car in its price class, and one with no serious faults. Except for its somewhat lower miles per gallon of gasoline, there is little to choose between this car and the *Chevrolet V-8*. A

Ford V-8 Fairlane Fordomatic. \$2215 (factory list price including federal excise tax of \$149). A

Plymouth Belvedere P-27 V-8 PowerFlite. \$2235 (factory list price including federal excise tax of



Dodge Custom Royal V-8

\$155). This car with 157 hp. engine is considered less desirable in several respects than the *Ford* and *Chevrolet* V-8's with automatic transmission. **B+**

Pontiac Star Chief Custom Hydra-Matic. \$2633

(factory list price including federal excise tax of \$171). A satisfactory car for those who wish to purchase in this price class. We believe that, with this car, a good many drivers may find it desirable to order power brake equipment, at \$35.50 extra. **A-**

Studebaker Champion DeLuxe with automatic

transmission. \$2077 (factory list price including federal excise tax of \$146). A good car of pleasing appearance, for town or city use. With the automatic transmission, the engine seemed to be slightly underpowered, but we believe that this car, if bought with a standard transmission, would be found satisfactory for the needs of drivers having a strong interest in economical use of gasoline. The estimated percentage depreciation based on last year's model is relatively low (only slightly more than that of the *Ford* and *Chevrolet*). **B+**

An Apple Parer, Corer, and Slicer

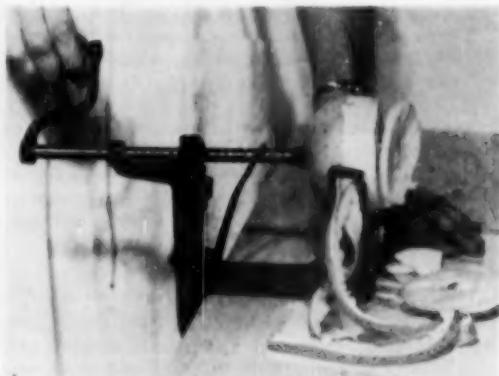
THE *White Mountain Apple Parer, Corer and Slicer* is designed to help with one of the homemaker's inconvenient kitchen tasks. It is made of painted iron and steel and has a wooden handle. When the parer is to be used, it is clamped to a table or other surface by means of a thumbscrew. The apple is placed at the end of a fork which is turned by a crank. A paring knife follows the surface of the apple and removes the skin in a spiral peel. At the same time a slicing knife cuts the apple into thin slices. The core should be all that remains in the fork at the end of the operation. According to instructions, the device can be used to pare without coring and slicing, by removing the slicing knife.

Instructions also state that fresh, hard fruit should be used. In practical use tests, CR used both firm winter apples and somewhat soft-textured summer apples. Results of these tests indicated that the device was inefficient and unsatisfactory in several ways on both types of fruit.

It did a poor job of paring and slicing the apples, for the most part. The paring knife was hard to keep at the proper angle, and the fork often twisted the core out of the apples before the paring and slicing could be completed.

Out of two to three pounds of apples put through the device in each of two separate pie-baking experiments, one apple was completely and satisfactorily pared each time, and some were not pared at all. Few were completely sliced before the core came out.

The principal disadvantage of the device was the necessity of doing most of the paring, coring,



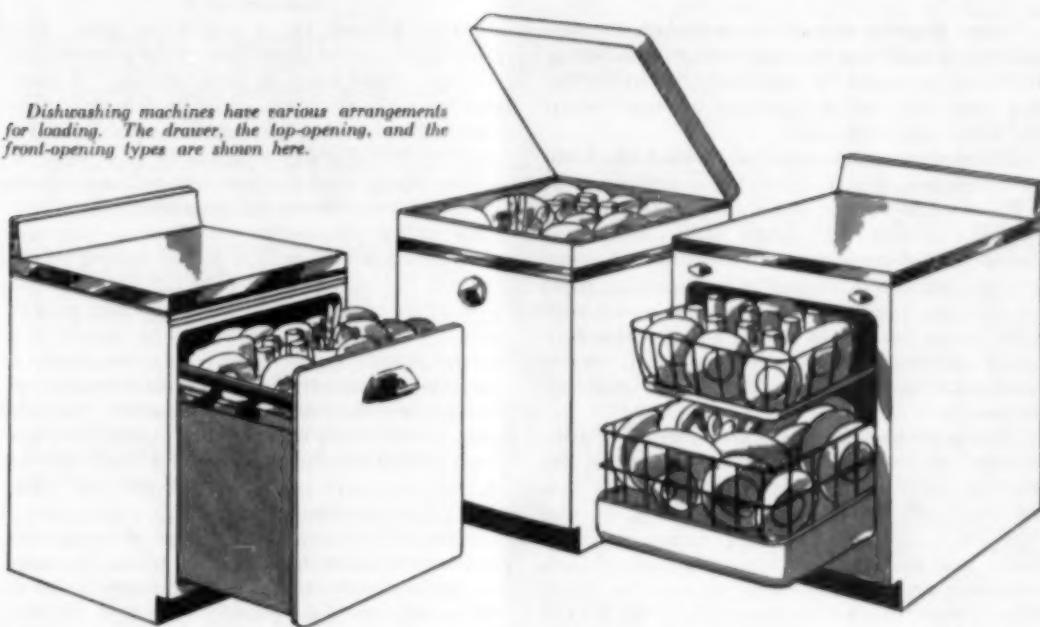
and slicing job with a paring knife after all. The time required to clamp the parer to a table, remove it, and wash it was not considered to be justified by its performance. It should be noted that the clamp opening was not great enough to use on a table or counter top having a thickness greater than one inch, and that there were no provisions in the design of the clamp to prevent its marring the table top.

C. Not Recommended

White Mountain Apple Parer, Corer and Slicer

(Goodell Co., Antrim, N.H.) \$3.75. Painted metal apple paring, coring, and slicing device to be clamped to a table or counter. Found to be inefficient and unsatisfactory in use.

Dishwashing machines have various arrangements for loading. The drawer, the top-opening, and the front-opening types are shown here.



Five Automatic Dishwashers

DIHWASHING machines have been on the market for nearly 40 years, but the number sold is far below sales of automatic washing machines, refrigerators, and many other large appliances. Undoubtedly, one important factor retarding sales is the cost of installation. This charge may run as high as \$200 in some cases. The portable models, of course, eliminate the installation problem and have accounted for an increasing share of dishwasher sales in the few years they have been on the market. Unfortunately, portable models often have not performed as well as their permanently installed counterparts.

Another reason for the rather limited acceptance of automatic dishwashers was that early models (and some current models) required scraping and rinsing of practically all the dishes before they were placed in the machine, and at the end of the cycle the dishes had to be dried by hand. The better machines of recent manufacture require only scraping of most dishes to remove large food particles, and they have means for drying the dishes automatically. However, even the best dishwashers do not clean pots and pans that are encrusted with cooked or burned food, and sometimes the silverware and glasses need "touching up" when they come out of the dishwasher.

The big question in many women's minds is "is a dishwasher worth while?" Dr. Elaine K. Weaver and Clarice E. Bloom of Ohio State University made a detailed study to determine the answer to this question.¹ Ten families each of four to six members participated in the study. For 30 days, detailed records were kept of the hand dishwashing process, which included time required for the complete process including clearing the table and wiping work surfaces, number of items washed, number of tea towels, and amount of detergent used.

Following this 30-day period, a dishwasher was installed in each home. Four to six weeks were allowed for the women to become accustomed to using the dishwasher; then records were again kept for a 30-day period.

The results of the study indicated that the dishwashers saved 33 percent to 62 percent of the time that had been used for the complete hand dishwashing process. On the average, the dishwasher cut the time in half. The dishwasher had other advantages over hand dishwashing, including better cleansing from a bacteriological standpoint, a sharp decrease in the number of tea towels used, and less breakage of dishes.

¹Ohio Farm and Home Research, Vol. 39, No. 287, March-April 1954, Ohio Agricultural Experiment Station, Wooster, Ohio.

When the dishwashers were installed, more water was used than was needed for dishwashing by hand, as might be expected. In six of the ten cases, the cost of detergent increased when the dishwasher was used.

Other observations reported by the Ohio State investigators, which have been confirmed in CR's tests, were that some dishes required pre-rinsing, utensils with badly stuck or burned foods needed treatment by hand, and some glasses and silverware had to be wiped by hand as spotting often occurs unless the water supplied is very soft. In homes where water supplied to the dishwasher is very hard, results with machine dishwashing may be very unsatisfactory.

A few points the prospective user of a dishwasher should remember are: for best results the temperature of water supplied to the machine should be at least 140°F; items, such as fine china and hand-painted dishes, woodenware, and some plastics, cannot withstand high temperatures and should be washed by hand; cost of operation will be reduced if a full load of dishes is accumulated before the dishwasher is operated.

CR's tests

The main purpose of the tests was to determine the performance of each machine in washing and drying dishes. Other important factors, including water consumption, time for complete cycle, electricity used, electrical safety, operation with low water pressure, and radio and television interference, were also checked.

In the dishwashing tests, service for six people was washed in each machine. The test loads included 6 plates, 6 soup bowls, 6 sauce dishes, 6 glasses, 6 cups and 6 saucers, a serving bowl, a serving plate, silverware, and 3 saucepans. Further trials were made in the *James* with service for four, as its capacity was less than that of the other machines in the test. The dishes were soiled carefully in a uniform manner, then scraped before loading into the machines. One hour after the machine completed its cycle, the dishes were removed and inspected.

Each machine was tested for electrical safety under normal room conditions and also after being exposed to high humidity. Some of the machines, as noted in the listings, had a high electrical leakage current, indicating a potential shock hazard. The permanently installed machines normally would be grounded when installed. This would overcome the problem of shock hazard if the ground wire is of sufficient size, No. 14 (Am. Wire Gauge) copper, or larger, and properly and securely clamped to a near-by

electrical ground, i.e., a cold-water pipe. But there is always the possibility of the ground connection coming loose or deteriorating. A portable machine, moreover, could be definitely dangerous if high leakage current existed. Even if a portable machine has a means for grounding, it is very likely that the machine will sometimes be plugged in before the ground connection is made unless the special new 3-prong plug and 3-wire cord is used with a proper mating receptacle in the outlet box. (The *GE* portable had a separate ground wire in the power supply cord. The *James* was grounded by means of a special water supply hose.) *Anyone using a portable dishwasher should always remember to connect the ground wire and fill-hose first, and then plug the cord into the electrical outlet. If there is no ground wire, one should be applied (No. 14 A.W.G., or larger, if the wire is much over 5 feet long), by a qualified electrician.*

None of the machines caused objectionable radio or television interference. All the machines worked normally with water pressures of 20 to 60 pounds per square inch. The cost of electricity was calculated on the basis of use of the machine three times a day, with electricity at 3½ cents per kilowatt-hour—an average figure; the cost figures do not include the cost of heating the water which was supplied to the machine through the hot-water piping of the home.

A. Recommended

Hotpoint Dishwasher, Model 40MC18 (Hotpoint Co., Chicago 44) \$325. (Similar unit in portable model is \$350; in dishwasher-sink combination, \$455.)

Performance was good in all respects, except that not all the silverware was dried.

Description: Model tested was for permanent installation. Rated 115 volts, 1400 watts. Dimensions: 27 in. wide, 24½ in. deep, 34½ in. high. Front opening; door hinged at bottom. Plastic-coated dish racks roll out for loading. Control could be advanced manually to skip or repeat part of the cycle, an advantage. Pilot light indicated when machine was operating. Propeller-type water agitator. Ring-shaped heating element operated during wash, rinse, and drying periods.

Performance in test: Complete cycle—washing, rinsing, and drying—required 50 min. Machine used 7.5 gal. of hot water and 640 watt-hr. of electricity for each cycle. The cost of electricity for one month, if washer is used 3 times a day, would be about \$2. Dishwashing results were very good. Dishes were dry at end of cycle, but silverware was not. Maximum air temperature reached in washing compartment during drying period, 165°F, considered sufficiently high. *Leakage current (1 ma.) was slightly higher than CR's limit. For this reason the portable model would be rated *B. Intermediate*.

B. Intermediate

General Electric Dishwasher, Model SU-60L2

(General Electric Co., Louisville, Ky.) \$339. (Similar unit in dishwasher-sink combination is \$480.)

Leakage current, indicative of a degree of electrical shock hazard, was dangerously high. In other respects this machine was considered worthy of an A-Recommended rating. It would be C. Not Recommended unless carefully installed with a positive and permanent ground connection.

Description: For permanent installation. Rated at 115 volts, 15 amperes. Dimensions: 24 in. wide, 25 in. deep, 34½ in. high. Dishwashing unit pulls out as a drawer, and is loaded from the top. Dish racks were plastic coated. Control could be advanced manually to skip or repeat part of the cycle, an advantage. Pilot light indicated when machine was operating, and showed a different color for each part of the cycle. Propeller-type water agitator. Ring-shaped heating element operated during wash, rinse, and drying periods.

Performance in test: Complete cycle—washing, rinsing, and drying—required 47 min. The machine used 7.7 gal. of hot water and 790 watt-hr. of electricity for each cycle. The cost of electricity for one month, if the washer is used 3 times a day, would be about \$2.50. Dishwashing results were good. Dishes and silverware were dry at the end of the cycle. Maximum air temperature reached in washing compartment during drying period, 170°F, considered sufficiently high. *Leakage current was dangerously high (over 10 ma.).

Westinghouse Dishwasher, Model DWB-13

(Westinghouse Electric Corp., Mansfield, Ohio) \$330. (Similar unit in portable model is \$360; in dishwasher-sink combination, \$470.)

Leakage current was dangerously high. In other respects this machine was considered worthy of an A-Recommended rating. It would be C. Not Recommended unless installed carefully with a positive and permanent ground connection.

Description: Model tested was for permanent installation. Rated 120 volts, 10 amperes. Dimensions: 24 in. wide, 26 in. deep, 34½ in. high. Dishwashing unit pulls out as a drawer and is loaded from the top. Dish racks were plastic coated. Control could be advanced to shorten or omit the drying period, if desired. Pilot light was on only during drying period. Propeller-type water agitator. Ring-shaped heating element operated during drying period.

Performance in test: Complete cycle—washing, rinsing, and drying—required 37 min. Machine used 6.7 gal. of hot water and 405 watt-hr. of electricity for each cycle. The cost of electricity for one month, if the machine is used 3 times a day, would be about \$1.30. Dishwashing results were good. Dishes and silverware were dry at end of cycle. Maximum air temperature reached in washing compartment during drying period, 190°F, considered sufficiently high. *Leakage current was dangerously high (over 10

ma.). Portable model of this machine would not be recommended because the risk of shock would be much greater than with the permanently installed and grounded machine.

B-

James Automatic Dishwasher, Model BDL

(James Manufacturing, Independence, Kans.) \$290.

The James did not have the capacity to wash nearly as many dishes as the other machines tested. It did a fairly good job when service for only four was washed.

Description: A portable model requiring no permanent connections or installation. A special device is supplied to connect the machine to the kitchen sink faucet. Rated 115 volts, 1500 watts. Dimensions: 24½ in. wide, 17½ in. deep, 36 in. high. Dishwasher is top-opening type. Dish racks were plastic coated. Control could be advanced manually to skip or repeat part of the cycle. An impeller and director vane extends along the bottom of the washing compartment. A rod-type heating element operated to heat water for the last rinse only. Lid opened automatically at end of cycle to allow natural air circulation to dry dishes.

Performance in test: Complete cycle—washing and rinsing—required about 17 min. when heater was turned off, 30 to 35 min. when heater was turned on. Machine used 4.5 gal. of hot water per cycle. Electricity used per cycle was 75 watt-hr. when heater was off, and about 400 watt-hr. when heater was on. The cost of electricity for one month, if machine is used 3 times a day, would be about 25c (with heater off) or about \$1.25 (with heater on). Dishwashing results were poor when service for a meal for 6 people was washed. When dishes and silverware for 4 were washed (with heater turned on), the results were fairly good. The claim of the *James* instruction booklet that the *James* washer "holds more than any other dishwasher" was found not to be true. The *James* does not hold *more*, and what is more important, it did a poor dishwashing job on service for six; the four other dishwashers tested were better than the *James* in dishwashing for six, and all but the *GE Mobile Maid* did as well, or better, on service for six than the *James* did on service for four. The dishes were dry about one hour after the cycle ended, when the heater had been turned on by the user (as would normally be done). The maximum temperature reached in the washing compartment, with heater turned on, was 180°F, considered sufficiently high. *Leakage current was satisfactorily low.

C. Not Recommended

General Electric Mobile Maid Dishwasher, Model SP 40-L

(General Electric Co.) \$270.

Leakage current was dangerously high. In other respects this machine was considered worthy of a B-Intermediate rating.

Description: A portable model requiring no permanent

installation. A special device is supplied to connect the machine to the kitchen sink faucet. Rated 115 volts, 15 amperes. Dimensions: 22½ in. wide, 23½ in. deep, 33¾ in. high. Dishwasher is top-opening type. Dish racks were plastic coated. Control could be advanced manually to skip or repeat part of the cycle. Propeller-type water agitator. Ring-shaped heating element operated during wash and rinse periods. Lid opened automatically at end of cycle to allow natural air circulation to dry the dishes.

Performance in Test: Complete cycle—washing and rinsing—required about 20 min. Machine used 6.1

gal. of hot water and 335 watt-hr. of electricity for each cycle. The cost of electricity for one month, if the washer is used 3 times a day, would be about \$1.05. Dishwashing results were fairly good, but dishes and silverware were not dry one hour after end of cycle. Maximum temperature reached in washing compartment during cycle was about equal to the temperature of the water entering the machine (on this account, considered less desirable than the other machines tested with respect to bacteriological cleansing). Leakage current (over 10 ma.) was dangerously high.

CR's Problems in Testing and Rating Dishwashers: It takes time to complete mechanical and electrical tests of a complex appliance like a dishwasher. Several months are required to secure the important data that determine performance and safety.

The electrical safety tests alone, for instance, require about three days for the initial conditioning and measurements before the machines are used to wash dishes. These tests are made under conditions of humidity and temperature which are likely to be encountered in various places where the machine will be used. After the dishwashing performance tests are made, electrical safety tests are repeated to determine if there has been deterioration of insulation in use and through exposure to conditions of varying humidity. Sometimes shock hazard—as indicated by electrical leakage currents—increases on a machine that is not used regularly.

Several automatic dishwashers tested by CR had high

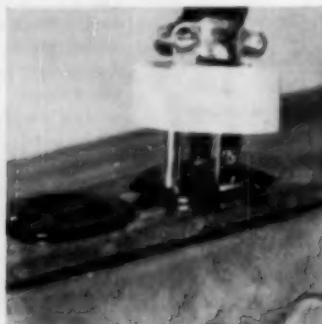
leakage current, so high in fact as to imply a very definite degree of shock hazard. A good, permanent connection to an electrical ground made by a well-qualified electrician would make the machine safer to operate, but a sure, permanent ground is not easily obtainable with a portable dishwasher.

With a permanently installed machine wired-in according to the maker's instructions, by a well-qualified, responsible electrician who can install a good, permanent ground connection, the leakage current hazard is minimized.

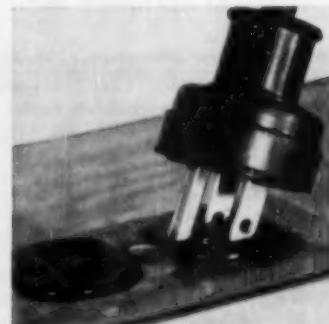
Subscribers who want our advice on electrical appliances before making a purchase are asked to be patient. Careful, thorough testing, particularly for such an important factor as shock hazard, is essential for all appliances, but doubly so in the case of dishwashers, washing machines, and dryers used near water, drainage, or heating pipes, or on damp or grounded floors where at times conditions may combine to permit a shock that may be fatal.



Two-bladed plugs and matching receptacles have been in universal use for many years, but a recently adopted electrical standard specifies a new three-bladed connector and receptacle for use with equipment in hazardous locations, which should lessen the possibility of shock from many household appliances. This new plug, besides the usual two prongs or blades for carrying the current, has a third U-shaped (or round) blade designed to make contact with the ground wiring first, and to join the grounding connections of the appliance to the electrical ground of the wiring system. Three-wire cable, with



one wire connected as a grounding wire, will thus be in order, in wiring in new branch circuits for 110-120 volts, to connect to these new receptacles (which provide not only for the new three-prong plug but will also take the older two-bladed plugs). The "third wire" or grounding conductor is entirely separate and distinct from the two wires used to conduct power to the appliance; its sole function is to safeguard the appliance by carrying leakage currents to earth or grounding a "stray" voltage arising from a defect or breakdown of insulation. Unfortunately, several of these three-prong plug/receptacle combinations which CR has examined do not, in fact, provide the intended safeguard in that one or the other of the two flat blades can com-



plete a circuit to the appliance before the ground connection is made by the third round or "U-shaped" blade if the plug is inserted as shown in the picture immediately above. The fault was in the location of the contact springs in the receptacle and was not a defect of the plugs or caps.

The new system, when properly installed by a competent electrician, should reduce considerably the hazard of shock that is present to some degree, or at times, in most electrical appliances now in use. These outlets should be installed for safety wherever electric tools, washers, dishwashers, ironers, toasters, mixers, deep-fat fryers, hair dryers, refrigerators, freezers, etc., will be used.

Audak Stylus-Disk

ONE SURE WAY to ruin an expensive phonograph record is to play it with a badly worn stylus. Even the so-called permanent stylus of the jeweled type (sapphire or diamond) will show signs of wear in time, though the diamond will usually last 25 to 100 times as long as a sapphire before damage becomes evident. The one positive way to determine a flat spot or a badly worn tip on a stylus is by means of visual examination with a microscope of about 40 power. However, not many people would wish to invest in such an instrument for the sole purpose of examining a stylus from time to time. (An expert may be able to judge stylus wear by use of a 10 power magnifier.)

Another way to detect wear is by listening to a record played. A person with a "good ear" can detect the distortion present in the higher frequency range resulting from a worn stylus. Unfortunately the average listener is quite unlikely to detect this distortion until needle wear has progressed to the point of causing considerable damage to record grooves.

One device recently offered for testing wear of a stylus is the *Audak Stylus-Disk*. This is a record made of a softer-than-average material with grooves modulated by a constant tone. The 10-inch disk had eccentric grooves for the .001-inch radius stylus used on microgroove records, on one side, and for the .003-inch radius stylus used on ordinary shellac records, on the other. There were 10 sets of grooves for microgroove record styli and 6 sets for styli for the older type records run at 78 revolutions per minute. According to the manufacturer, a stylus that is worn enough to damage records will, when played on the *Stylus-Disk*, change the color of the grooves from black to a shade of gray, or show score marks.

In CR's test, only a very badly worn needle caused the change in color on the disk. Several

sapphire styli known to be worn by virtue of the fact that they have been in use for from 2 to 5 years or hundreds and hundreds of plays each were tried on the disk with no noticeable effect. (According to experts, a sapphire is good for only about 75 plays before wear is noticeable.) Examination under a microscope of 50 power showed that the tip of one of the microgroove styli was worn flat to an extent greater than .001 inch.

A steel needle (.003-inch radius) which was recommended for one play only by its manufacturer was used for 12 playings of a 12-inch record. Examination under the microscope showed a sharp edge with the metal rolled over the side forming a distinct burr. With this needle, too, there was no evident change on the *Stylus-Disk* test record.

The only stylus tried which changed the color or appearance of the grooves was one which had been brutally treated by a grinding wheel to give a large flat region, and this needle was so badly deformed that it was wholly unsuited for playing any record.

It would seem that blunted needles or those worn but still smooth would not show up on the disk as needing replacement. We believe it likely that only a very badly worn, poorly polished, or chipped stylus would be detected with any certainty.

C. Not Recommended

Audak Stylus-Disk (Audak Co., 500 Fifth Ave., New York City) \$3.90. Device showed indication of wear only on stylus with grossly bad flat area. With this method of checking a stylus, it appears that good records could be damaged considerably before the device would disclose that the stylus was in bad condition.

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The Treasury Department has stated:

Contributions¹ to your organization by individual donors are deductible by such individuals in arriving

at their taxable net income in the manner and to the extent provided by section 23 (o)² of the Revenue Act of 1938, or section 23 (o)² of Chapter 1 of the Internal Revenue Code.

Editor's Notes:

¹Beyond the subscription price.

²Referring to the right of deduction from income of contributions to non-profit corporations, foundations, etc., organized and operated exclusively for certain purposes (including scientific and educational

The Baby's Diapers

DIAPERS are possibly the most important part of baby's wardrobe. It has been estimated that it takes no fewer than four dozen to keep the average baby in diapered dress, and each diaper of these four dozen will be used about two times a week.

As there are a number of different kinds of diapers on the market, it is well to consider their characteristics before investing in the minimum number that will be needed.

Birdseye diapers

The birdseye 27 x 27 inch square has been known since grandmother's day. The fabric is woven with a small diamond-shaped pattern which gives it its name. Birdseye diapers are somewhat stiff when new, but become softer with use and laundering. Once upon a time the birdseye square was folded into a triangle and pinned on baby, which led to unfortunate drainage problems in use. Nowadays, the square is folded into a rectangle and pinned so the diaper fits like a pair of shorts.

Birdseye diapers are stronger than flannel, gauze, or knit diapers. They are medium weight, like flannel diapers, about twice as heavy as gauze but only half as heavy as knit diapers per square yard of fabric. CR found that, on the average, birdseye diapers will take up as much moisture as gauze and knit diapers and somewhat less than flannel diapers. It was found in this study, however, that when a volume of liquid is released at one time, the birdseye diapers are more likely to permit the liquid to pass through the fabric than are the other three.

Flannel diapers

Flannel is a soft, napped fabric which is pleasant to the touch. In use, however, the nap wears off, and a flannel diaper tends to become more smooth and less absorbent. Like birdseye diapers, flannel diapers are 27 x 27 inches before hemming—about 26 x 27 inches as sold.

Flannel diapers are about as strong as gauze diapers and weigh about the same as birdseye.



They are superior to birdseye, gauze, and knit diapers in total absorption, that is, the percentage of moisture the fabric will take up. They are better than birdseye diapers and a little better than gauze diapers in absorbing a lot of liquid quickly, but not nearly so good as knit diapers in this respect.

Gauze diapers

The gauze diaper is rectangular in shape, usually 20 x 40 inches. Gauze fabric is of loose construction, and diapers have two layers of the material woven together. Gauze diapers are light in weight, wash easily and dry quickly, but they have a tendency to wrinkle, and some

get out of shape in drying. Some gauze diapers have a line woven in to guide the folding.

CR found the gauze diapers to be about the same as birdseye and knit diapers in total absorption and nearly as good as flannel in retaining liquid.

Knit diapers

Knit diapers are usually made of a tubular knit fabric, bound at the ends in one of several different ways. They are heavier than birdseye, flannel, or gauze diapers, and take longer to dry. Although they are bulkier than other diapers, some people prefer to use them because the knit fabric stretches as the baby moves.

Knit diapers tend to get out of shape with use and laundering. In CR's test, in which the diapers were dried in a gas dryer, the knit diapers shrank about 16 percent in length and stretched about 6 percent in width. Knit diapers are about average in total absorption, but far superior to the other three kinds in retaining an amount of liquid suddenly released.

Shaped diapers

Also available are a number of ready-shaped diapers including several snap-on styles. They come in birdseye, gauze, or knitted diaper fabrics. Some diapers have special provisions for diaper liners or disposable diapers or diaper pads

can be used. This kind is especially handy for traveling or for any other time when washing diapers or taking care of soiled ones is likely to be a special problem.

In this test, knit diapers and the specially shaped diapers took longer to dry than the other kinds, and would cost more to dry than the others in an automatic dryer.

CR's tests

This study, which included all four kinds of diapers mentioned, included tests which would indicate the strength and durability of the diapers, water absorption, drying time, and the shrinkage that would occur in laundering. Results of some of the tests are summarized in Table I, page 20, for the convenience of readers. Gauze diapers as a group did not rank high, all tests considered, because of their relatively low weight per square yard and low breaking strengths (one measure of durability). There are, however, those who will prefer gauze diapers because of other characteristics, such as short drying time.

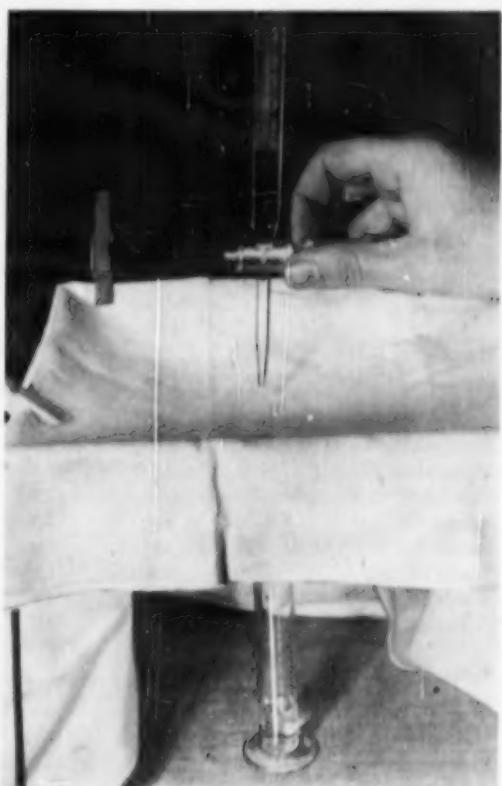
Two important tests had to do with water absorption. The total absorption was calculated as a percent of dry weight. Three diapers of each brand were weighed at room temperature and humidity and then again after the group was soaked in cold water and the water then extracted in an ordinary automatic washing machine with centrifugal extractor for three minutes.

Since a diaper must absorb water rapidly to be most effective, a different test was devised to measure this property (see illustration). The less the amount of water passing through the diaper in this test the better, as it shows rapid absorption. The birdseye absorbed an average of 3.7 cc. of the 25 cc. test quantity of liquid. The flannels retained an average of 7.7 cc., and the gauzes 6.2 cc.

The shrinkage figures obtained and reported in this study were based on measurements made before and after the diapers were washed in an automatic washer and dried in a gas dryer. Previous studies have shown that shrinkage is likely to be greater in dryer-dried textiles than in line-dried. Dr. Elaine Knowles Weaver of Ohio State University, for example, reported that, in one study after 50 wettings and dryings, gauze diapers dried outdoors shrank 5.7 percent, in the dryer, 8.8 percent; birdseye diapers, outdoors, 8.8 percent, and in the dryer 16.1 percent. As Dr. Weaver said, "the trouble is that as the baby gets bigger, the diaper gets smaller." The differences between these figures and CR's are believed to be due to the fact that the Ohio State

tests were based on 50 dryings, whereas shrinkage reported in this article was based on a single washing and drying only. CR's figures may be considered useful in judging the relative shrinkage tendencies of the several kinds and makes.

It is of interest that drying in a dryer, though it causes more shrinkage than line drying, is still a good method to use. The Journal of the American Medical Association reports that a test made at the University of Michigan Hospital showed that a home automatic washer and dryer provided a quick safe way to wash diapers. In the hospital's procedure, soiled diapers were



One Test for Measuring the Absorption Properties of a Diaper

The test was made by placing a single layer of the diaper to be tested across the opening of an iron stand 9-3/4 inches square and 9-3/4 inches high. The cloth was allowed to sag into the opening to form a cup approximately one inch deep: spring clothespins held the cloth in place. Washed diapers were used. A 25 cc. burette was placed vertically above the center of the cloth over the opening in such a manner that the discharge orifice was 1/2 inch above the cloth at its lowest point. The burette discharged 25 cc. in 41 to 43 seconds. The amount that the diaper absorbed was determined by measuring the water that passed through the diaper.

Table I—Data on Fabrics of the Diapers Tested

Brand	Size		Weight, oz. per sq. yd.	Thread Count		Tensile Strength, lb.		Shrinkage, %	
	Length	Width		Warp ^a	Filling ^b	Warp ^a	Filling ^b	Warp ^a	Filling ^b
Birdseye									
Cone Style 570	26	27	3.0	70	39	50	42	12	0
Dexter**	15	16	4.0	62	48	33	54	6	0
Honeysuckle No. 105	26	27	3.2	62	43	42	47	9	6
Honeysuckle No. 106	26	27	3.7	62	49	44	67	9	5
Honeysuckle No. 107	29	30	3.8	62	49	44	67	8	5
Honeysuckle No. 108	26	28	4.1	62	52	50	71	2	3
Keystone**	8, 15	15	3.2	56	39	38	53	6	3
Pin-Free**	13	18	3.9	62	52	39	70	6	4
Spiegel No. 2821	26	27	4.0	69	51	48	68	9	3
Red Star	26	27	4.1	62	48	47	64	8	6
Wards No. 606	26	27	3.9	62	45	49	48	8	8
Wards No. 608	26	28	3.3	56	50	38	47	7	7
<i>Average</i>			3.7	62	47	44	58	8	4
Flannel									
Honeysuckle No. 101	26	28	2.9	42	41	28	22	7	5
Honeysuckle No. 102	26	27	3.7	42	40	35	28	7	2
Spiegel No. 2822	26	27	3.2	43	42	30	21	7	4
Wards No. 600	26	27	3.0	43	39	32	21	5	4
<i>Average</i>			3.2	42	40	31	23	7	4
Gauze									
Chix	21	40	1.7	39	38	33	23	10	10
Curity	21	40	1.7	40	37	36	18	4	8
Honeysuckle No. 111	20	40	1.5	40	32	34	12	5	9
Honeysuckle No. 112	21	41	1.7	39	38	33	21	5	9
Pin-Free**	14	20	1.5	42	35	30	13	7	6
Spiegel No. 2823	20	40	1.5	40	33	31	12	4	7
Spiegel No. 2826	21	40	2.0	40	35	28	23	6	4
Wards No. 602	20	40	1.5	40	31	32	13	8	10
Wards No. 616	21	39	1.8	40	36	36	24	6	7
<i>Average</i>			1.7	40	35	33	18	6	8
Knit									
Honeysuckle No. 115	20	9	6.9	38	23	50	25	18	8*
Pant-ease**	20	8	7	32	17	44	32	14	6*
Rubens	20	8	7.2	42	22	56	28	15	5*
<i>Average</i>			7.0	37	21	50	28	16	6

*Increase.

**shaped diapers.

a—Knit, wales.

b—Knit, courses.

dropped into a germicidal solution (6 ounces of Watkins solution¹ for every gallon of water). Then, 25 diapers at a time were put in the washer, rinsed, washed, rinsed again, three times for

good measure, and spun. The diapers were given 30 to 40 minutes in the dryer, and came out satisfactorily clean and sterile for hospital use.

Prices given are prices for a dozen diapers and

¹A mixture of certain creosols with soap, isopropyl alcohol, and water.

ranged from about 18 cents to 60 cents a diaper, with the higher prices being for specially shaped diapers.

A. Recommended

BIRDSEYE

Honeysuckle, Sanforized (Sears-Roebuck's Cat. No. 29-108) \$3.29 a dozen, plus postage. A strong diaper, having little shrinkage. Good total absorption. Somewhat slow to dry. Relatively slow rate of absorption, characteristic of birdseye fabric. **2**

Red Star (George Wood, Sons & Co., Philadelphia 5; Spiegel's Cat. No. 28-2829) \$2.89 a dozen, plus postage. Not listed in current catalog. A good diaper, about on a par with *Honeysuckle, Sanforized*, but had somewhat greater shrinkage. **2**

Spiegel, Best Quality (Spiegel's Cat. No. 28-2821) \$2.65 a dozen, plus postage. A good diaper. Had somewhat greater shrinkage than *Honeysuckle, Sanforized*, but dried quickly. **2**

Wards Supreme (Montgomery Ward's Cat. No. 31-606) \$2.62 a dozen, plus postage. A good diaper, about on a par with *Honeysuckle, Sanforized*, but had greater shrinkage. **2**

Dexter (Fred Dexter & Staff, Houston, Tex.) \$3.75. Sold with two pins on a chain. A shaped specialty diaper. Generally good, but cloth had low strength in warp direction. Diaper dried slowly. **3**

Pin-Free (Pin-Free Diaper Mfg. Co., 89 Brighton Ave., Boston) \$7.20. A shaped diaper with snaps. In test, pad puckered because of unequal shrinkage of different parts. Inner gauze layers of this diaper, which had birdseye-cloth outer fabric of generally good properties, had low total absorption. Dried slowly. **3**

FLANNEL

Honeysuckle, Best Quality (Sears-Roebuck's Cat. No. 29-102) \$2.65, plus postage. Heavy nap, very good absorption rate. Ranked fair to good in all tests. **2**

KNIT

Honeysuckle (Sears-Roebuck's Cat. No. 29-115) \$3.15, plus postage. Ranked good or fair in all tests except for drying time. Relatively slow drying and distortion in laundering are characteristic of the knit fabric. **2**

B. Intermediate

BIRDSEYE

Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29-105) \$2.09, plus postage. **1**

Wards, Standard (Montgomery Ward's Cat. No. 31-608) \$1.98, plus postage. **1**

Honeysuckle, Better Quality (Sears-Roebuck's Cat. No. 29-106) \$2.62, plus postage. **2**

Honeysuckle, Better Quality (Sears-Roebuck's Cat. No. 29-107) \$3.29, plus postage. Same diaper, but larger size than Cat. No. 29-106. **2**

Keystone, Style 258 (Keystone Mills, Athens, Ga.) \$4.98. A shaped diaper with snaps (3 and 3 per side). **3**

FLANNEL

Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29-101) \$2.09, plus postage. **1**

Spiegel (Spiegel's Cat. No. 28-2822) \$2.15, plus postage. **1**

Wards, Standard Quality (Montgomery Ward's Cat. No. 31-600) \$1.98, plus postage. **1**

GAUZE

Honeysuckle, Best Quality (Sears-Roebuck's Cat. No. 29-112) \$2.92, plus postage. **2**

Spiegel, Best Quality (Spiegel's Cat. No. 28-2826) \$2.94, plus postage. **2**

Wards, Supreme Quality (Montgomery Ward's Cat. No. 31-616) \$2.92, plus postage. **2**

Chix (Chix Baby Products Div., Chicopee Mills, Inc., 47 Worth St., New York 13; Sears-Roebuck's Cat. No. 29-116) \$3.75, postpaid. **3**

KNIT

Pant-ease (Pant-Ease Infant Wear Co., Arcade, N.Y.) \$3.35. A tubular-knit diaper shaped with areas of different sizes of stitches. **2**

Rubens (Montgomery Ward's Cat. No. 31-614) \$3.95, plus postage. Not listed in current catalog. **3**

C. Not Recommended

BIRDSEYE

Cone, Style 570 (Spiegel's Cat. No. 28-2891) \$1.99, plus postage. Hems frayed during tests. **1**

GAUZE

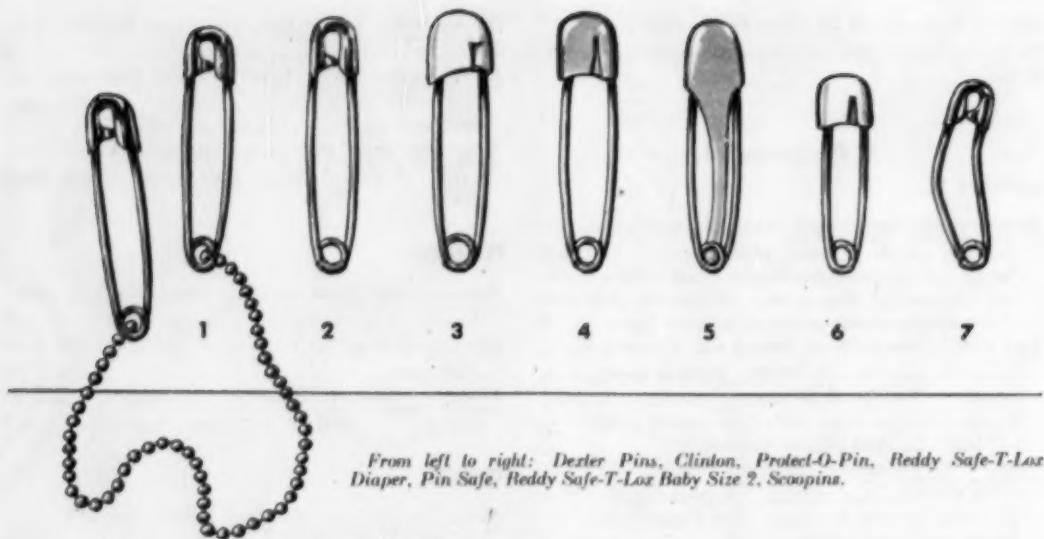
Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29-111) \$2.66, plus postage. **2**

Spiegel, Good Quality (Spiegel's Cat. No. 28-2823) \$2.59, plus postage. **2**

Wards, Standard Quality (Montgomery Ward's Cat. No. 31-602) \$2.66, plus postage. **2**

Curity (Kendall Mills, Div. Kendall Co., Walpole, Mass.) \$3.50. **3**

Pin-Free (Pin-Free Diaper Mfg. Co.) \$7.20. A shaped diaper with cotton cloth inserts with snaps (2 and 5 per side). **3**



Diaper Pins

DIAPER PINS, like diapers themselves, can be obtained in several styles, sizes, and prices. CR examined those shown above in connection with the diaper study.

The all-metal pins all showed evidences of corrosion after a considerable period of time during which they had been pinned in a damp, soiled diaper. The other three pins which had plastic clasps held up well in this test, and these three, too, were most liked by the mothers who evaluated their convenience in use for CR.

A. Recommended

Protect-O-Pin (Reliance Products Sales Corp., Pawtucket, R.I.) 25c for 4.

Reddy Safe-T-Lox, Baby Size 2 (The Reddy Co. Inc., Montpelier, Vt.) 25c for 4.

Reddy Safe-T-Lox, Diaper (The Reddy Co. Inc.) 25c for 3.

Pin Safe (Alfa Mfg. Co., Los Angeles 16) 19c for 4. A pin with a plastic guard. Worked well, but was judged somewhat inconvenient.

B. Intermediate

The following were all metal and showed evidences of some corrosion in the test.

Scoopins (The Warren Featherbone Co., Three Oaks, Mich.) 19c for 6. A shaped pin, judged easy and convenient to use.

Clinton, Size 3 (Oakville Co., Div. Scovill Mfg. Co., Waterbury, Conn.) 10c for 5. Tested as an example of a typical common safety pin.

Dexter Pins (sold with *Dexter* diapers at no charge—see diaper listings). Two metal safety pins, joined by a ball-chain.

Report on Miniature Cameras, Part III, Delayed

CR regrets to report that the article on higher-priced 35 mm. miniature cameras, Part III, mentioned in the October 1954 *CONSUMERS' RESEARCH BULLETIN*, has been delayed unavoidably. The consultants assigned to this series of articles, because of other important commitments, were unable to complete their work on studies underlying Part III, on miniature cameras retailing at \$100 up.

Tests are now being made on some of the 35

mm. cameras in the bracket above \$100, and other tests are scheduled to be made as soon as samples can be obtained. Subscribers, many of whom have written in asking when the third report will be issued, are assured that every effort is being made to get the work completed and the report on some of the more important "top-drawer" cameras prepared for publication as soon as possible.

1955 Television Receivers

THE extensive discussion given in the past year or so to the coming of color television receivers for the home must not have greatly affected the demand for black-and-white receivers. In spite of contrary expectations of several of the biggest manufacturers, sales of television sets maintained a steady and substantial rate for the year 1954. It is felt, however, that a noticeable percentage of the more than 7,000,000 receivers that consumers purchased in 1954 were installed in homes as "second sets." Some manufacturers have even resumed their promotion of the relatively small 14-inch picture tube, for use in so-called portable receivers.

CR's choice of brands to test

There are now at least 60 different manufacturers of television receivers. However, it is estimated that *five of the 60 manufacturers have produced half of the more than 31,000,000 receivers now in use*, and the 10 major manufacturers account for almost 75 percent of all sets sold. Obviously neither time nor staff is available to test the products of all 60 manufacturers, and for that reason CR each year tries to include in its tests typical sets of those 12 to 15 makes that are in widest sale and likely account for 85 to 90 percent of all the receivers sold. Exceptions are sometimes made where correspondence from subscribers indicates strong interest in a particular make, even though it may not be an important one in respect to the number of receivers produced. Omission of a particular brand should not be construed to imply an unfavorable view of the make; it is quite possible that some makes not tested would be comparable in performance to some which were tested and given *A-Recommended* ratings. On the other hand, the wise purchaser will often do well to confine his choice to one of the brands tested and found satisfactory rather than to buy a much less well-known brand on which test information is not available—unless he is in a financial position to take a chance, or knows from the performance of a given set in the hands of neighbors or friends that he is not taking any great risk of poor performance or high service costs. As a rule, it is not wise to buy a so-called private brand receiver made by some unknown

manufacturer and marketed under the label of a department store or chain. Such sets are likely to put one at a serious disadvantage when it comes time to turn a receiver in on a new one of a later and better design.

Sometimes subscribers think that CR's reports on 21-inch table models (the most popular size) are not applicable if the inquirer is interested in a console model or one having a 17-inch viewing screen. Briefly, it is the general rule that a manufacturer's line will include two basic chassis, one, so-called competitive, the other a "de luxe" unit representative of the best he produces. While it might seem that the de luxe model would be more expensive, this is not always the case, since the cost of the cabinet usually represents a considerable fraction of the net cost of a receiver to the consumer. Thus a competitive chassis in a fancy console mounting may sell at a higher price than the top-grade or "de luxe" chassis in a comparatively inexpensive cabinet. Moreover, the maker may use either chassis, with minor circuit modifications, in sets with 17-inch picture tubes. It is CR's custom to list those other models in a manufacturer's line which employ a chassis similar to the one used in the receiver tested. It is suggested that, if a choice cannot be made from those models, subscribers ask the dealer to demonstrate any other model employing a similar chassis, since it often happens that complete information regarding models may not be available at the time the BULLETIN is issued; model numbers and the various combinations of chassis and cabinet are in a constant state of change in the lines of various manufacturers.

Color television

In the past few months, consumer interest in the purchase of a color television receiver has waned considerably. Several manufacturers who had been expected to start production of color sets have announced delays of several months. It would appear that the price at which the first production sets were offered was high enough, and the uncertainties of operation impressive enough, to discourage even the substantial number of families which do not have to be at all careful with their expenditures.

As compared to black and white, very few

Comparison Chart of 1955 Model TV Receivers Tested by Consumers' Research

Make and Model	Type ¹	Price ¹ \$	Picture ²		Sound		
			Quality	Stability	Speaker Size, inches	Quality ³	Volume ³
Admiral C2256N	21-F	200	g	g	8	av	g
Crosley G21TOWH	21-T	150	e	g	4	b-av	f
CBS Columbia 22C05	21-F	200	g	g	5	av	g
DuMont Winsted	21-F	280	e	g	10	av	e
Philco 22C4119	21-F	240	g	g	6	av	g
RCA 21S-502	21-T	220	g	g	5	av	g
Silvertone 5114A	21-T	170	g	g	5	av	g
Sparton 17A203	21-F	330	g	g	9	a-av	e
Stromberg-Carlson 22CW	21-F	310	g	g	4 x 6	av	g
Westinghouse H799T17	17-T	160	e	g	5	av	g
Zenith R2229R	21-T	210	g	g	5	av	g
General Electric 21T17	21-T	180	f	p	4	b-av	p
Hoffman 21M166	21-T	200	g	g	6	b-av	e
Emerson 1006, Series C	21-T	200	f	g	6	b-av	g
Motorola 21T17	21-T	200	p	p	5	av	g

¹17, 21—tube size in inches; T—table model; F—console. ²e—excellent; g—good; f—fair; p—poor. ³a-av—above average; av—average; b-av—below average.

color broadcasts are yet scheduled. The major networks, for example, had fewer than 100 hours of colorcasts during the fall 1954 season, and there are no indications, at this time, that the pace will accelerate, at least to any great extent. It has been noticed, however, that the picture quality of these colorcasts as received in black and white on regular black-and-white receivers (which has been relatively poor in many instances) is improving, indicating that the broadcasters are making good use of these programs in improving their techniques of transmission.

Recently, RCA has announced that they will make their 21-inch color tube available to other manufacturers at a much reduced price and will themselves assume the losses involved in the reduced price. Their action will likely be very helpful in giving other color TV manufacturers needed reassurance, since the new \$100 price on the color tube itself (formerly \$175) should enable a manufacturer to reduce the selling price of his receiver by about \$150, when distributor and dealer markups are considered. It appears, however, that some manufacturers are

doubtful that a reduction in price will be possible even with the reduced price of the color tube; others feel that the possible reduction is not sufficient to start the color-ball rolling. Briefly, it would appear that color receivers must sell at \$500 or less, with a far greater proportion of programs in color than at present, before any large number of people will show any interest at all in this new medium. The demand for black-and-white receivers will have to fall off considerably, too, before most manufacturers will be more than mildly interested in doing the expensive and continuous design and development work required for color receivers. Right now, color set production can hardly be said to be active at all, and very, very few sets are being produced.

A. Recommended

Crosley Super V (Crosley Div., Avco Mfg. Co., Cincinnati) \$149.95.

Picture quality in this receiver was very good, though it functioned with fewer tubes than most receivers. Sound quality, however, was only fair.

(See also December 1954 Bulletin)

Fringe-Area Operation ¹	Amount of Interference ²		Comparative Operating Cost ³	Rating
	Created	Rejected		
g	av	av	av	A
e	av	b-av	b-av	A
g	b-av	av	a-av	A
f	b-av	av	a-av	A
g	av	av	av	A
g	av	av	b-av	A
g	av	av	a-av	A
g	av	av	av	A
f	av	a-av	a-av	A
e	av	av	av	A ₄
f	av	b-av	av	B
g	av	av	b-av	B
f	av	b-av	av	C
p	av	b-av	b-av	C

A table model with 13 tubes, 1 rectifier, 2 selenium rectifiers, and a 21-in. picture tube. Picture mask size, 19 in. wide x 15 in. high. Cabinet was constructed of "hardboard." Estimated monthly operating cost, 60c (very low). The picture was very clear, steady, and of ample brightness. Sensitivity was good and ample for fringe-area locations. Ability to reject external interference, satisfactory in most respects (susceptibility somewhat greater than most receivers tested to interference close to the intermediate frequency of the set). Amount of "snow" in picture, desirably low. Operated satisfactorily at reduced line voltage. Quality of sound output from 4-in. speaker, below average (estimated acoustical range, 150 to 7000 c.p.s.). The chassis on this receiver was at full line potential, which is, on the whole, not a desirable construction. The *Super V* chassis was adequately shielded. Servicemen, however, will need to take proper precautions when servicing this set, as with the common ac-dc radio receivers. ⁴A similar chassis is used in *Crosley H21TOWH*. ¹

¹On the basis of 4.25 hr. of operation daily with electricity at 3.5c per kWhr.

Silvertone (Sears-Roebuck's Cat. No. 5114A) \$169.95.

A receiver giving generally good all-around performance. Not outstanding, but should serve very satisfactorily.

A table model with 14 tubes, 1 rectifier, 2 selenium rectifiers, and a 21-in. picture tube. Mask size, 17 in. wide x 12½ in. high. Cabinet constructed of light wood. Estimated monthly operating cost, 70c (low). Picture was steady, clear, and of ample brightness. Sensitivity was good and adequate for most fringe-area locations. Ability to reject external interference, good. Radiation produced by this receiver and capable of interfering with other receivers, relatively low (desirable). "Snow" in picture (called noise by the engineer), desirably low. The set was found to operate satisfactorily when the line voltage was reduced to 100 volts, as may happen at times in the home. Quality of sound output from 5-in. speaker, satisfactory (estimated acoustical range, 125 to 6000 cycles per second, about average). ⁴Cat. No. 5116A, 5126A, 5128A, and 5130 use the same chassis. ¹

Westinghouse, Model H799T17-15 (Westinghouse Electric Corp., Metuchen, N.J.) \$159.95.

This receiver's performance was very good. However, the audio quality was average, as is true of most table-model TV receivers.

A table model with 15 tubes, 2 rectifiers, and a 17-in. picture tube. Picture mask size, 14½ in. wide x 10½ in. high. Cabinet constructed of light plastic material. Estimated monthly operating cost, \$1.¹ The picture was very clear, steady, and of ample brightness. Sensitivity was satisfactory. Ability to reject external interference, very good. Radiation from receiver, desirably low. Operation at reduced line voltage, mostly satisfactory except for slight reduction in picture size. Quality of sound output from 5-in. speaker, satisfactory for a table model (estimated acoustical range, 150 to 5000 c.p.s.). ⁴(Chassis V2260-15 3G29) (believed to be advertised as No. FR760) is used in 17-in. and 21-in. table models and in some 21-in. consoles. ¹

Sparton, Model 17A203 (The Sparks-Withington Co., Jackson, Mich.) \$329.95.

A receiver of good performance in general, and its audio section offered better-than-average listening.

A console model with 19 tubes, 3 rectifiers, crystal detector, and a 21-in. picture tube. Mask size, 18½ in. wide x 13½ in. high. Cabinet constructed of light wood. Estimated monthly operating cost, \$1.05.¹ The picture was clear, steady, and of ample brightness. Sensitivity was ample for most fringe-area locations. Ability to reject external interference, good. Potential interference with other receivers radiated by this receiver, desirably low. Operation at reduced line voltage, satisfactory. Quality of sound output from 9-in. speaker, much better than average (estimated acoustical response,

80 to 8000 c.p.s.). ¶The "Dyna-solt" chassis used in the receiver tested is also used in the *Wedgewood, 20T203, 20T204, 20T403, 20T404; Hilton, 21T203, 21T204; Sheraton 17A204; and Biltmore, 18A203, 18A204.*

3

Stromberg-Carlson, Model 22CW "Studio" (Stromberg-Carlson Co., Rochester 3, N.Y.) \$309.95.

Picture section was above average, but sound quality was no better than average. Receiver was well constructed and should give good service.

A console model with 19 tubes, 2 rectifiers, and a

21-in. picture tube. Picture mask size, 17 in. wide x 13 in. high. Wood cabinet, well constructed. Estimated monthly operating cost, 95c. The picture as received was clear, steady, and amply bright. Sensitivity was good and ample for fringe-area locations. Ability to reject external interference, good. Potential interfering radiation produced by the receiver, low (desirable). "Snow" in picture, desirably low. Operated very satisfactorily at reduced line voltage. Quality of sound output from 4 x 6 in. oval speaker, satisfactory (approximate acoustical range, 100 to 8000 c.p.s.). ¶Models 21T, 22T, P21, and P22 use a similar chassis.

3

"Water-Conditioning" Gadgets

COMMENTING on gadgets for "conditioning" of water, now a very popular item for aggressive sales activity by promoters, plumbing supply dealers, and door-to-door salesmen, a paper by B. Q. Welder and Everett P. Partridge of the Hall Laboratories, Inc., Pittsburgh, states that the pattern of selling is likely to comprise several elements from the following list:

1. It is claimed that the gadget solves any and all problems encountered in the use of water: scale, corrosion, slime, taste, odor.
2. The gadget is alleged to produce many beneficial side effects: it improves growth of vegetation, makes water feel smoother, makes soap act more powerfully even though the hardness of the water is not decreased.
3. The gadget is stated to achieve its remarkable results because of the alleged action in peculiar ways of natural forces, such as electricity, magnetism, catalysis, radiation, ultrasonic vibration, all described in language which sounds scientific but cannot be understood.
4. The gadget requires little or no attention and no chemicals are required.
5. The gadget is represented to be so sure fire that the initial cost will be refunded if it does not prove satisfactory during a period of 60 or 90 days.
6. Testimonial letters, stated to be unsolicited, are offered to prove that performance has been excellent.
7. Tests under controlled conditions in the laboratory are generally deprecated as not being capable of showing the performance in practice.
8. Advertising or promotion by mail is avoided or is much more conservative in tone than that supplied by direct contact.

The article continues:

Some engineers of native intelligence and good training have been known to follow a policy of trying out each device offered to them. Such a solution is perhaps an eminently practical one when the

gadget has been recommended to the vice president by an influential friend over the luncheon table. It does lead immediately to the citation of the company by the promoter as a satisfied customer. Many a large corporation has been startled to find itself in such a position as a result of having installed—and subsequently discarded—a gadget in some obscure corner of the organization.

The paper by Messrs. Welder and Partridge was presented at the Fourteenth Annual Water Conference of the Engineers' Society of Western Pennsylvania on October 21, 1953, and printed in the Proceedings of the Conference.

The well-formulated considerations and analysis of pseudo-scientific claims set forth in the foregoing are of importance to everyone who is tempted to buy a gadget or device or chemical mixture which is alleged to produce its results by ways that are unknown or unexplained, or which "sound scientific but cannot be understood." The points made apply directly and usefully to many such materials and devices as gasoline economizers, carbon removers, oil additives, water "conditioners," corrosion preventers, indoor TV antennas and interference eliminators, silver-plating compounds, food-saving and humidity-controlling gadgets for use in the refrigerator, and a variety of devices that are said to work according to new, hitherto undiscovered principles. Readers should note that certain appliances alleged to be air conditioners are now being offered which are in this category. They can be distinguished from real air conditioners by the fact that their price is far below what is normal for an air conditioner working on the compression principle (in which a gas is compressed by use of motor and pump and then expanded in a tube of large surface area to absorb heat from the surrounding air).



Synthetic Detergents

THE CONSUMER is primarily interested in obtaining a synthetic detergent which will wash the clothes satisfactorily, whether it be one of the suds-controlled type or one producing high suds. Until recently, however, only two low-sudsing syndets were generally available, *All* and *Spin*, compared to the dozen or more different high-sudsing syndets. Making their appearance now to bring the number to five are *Ad*, *Dash*, and *Vim*. Low-sudsing detergents are particularly designed for use with automatic washers which have a rotating cylinder (tumbler-type washers), as absence of suds favors more effective washing action with this type of washer. However, such detergents serve equally well in other types of washing machines. (The value of non-sudsing detergents in the rotating-cylinder washers lies in the fact that the non-sudsing kinds do not cushion the drop of the clothes and reduce the washing action.)

To determine the effectiveness of the new low-sudsing syndets, three of these and three well-established high-sudsing syndets were tested, using the same methods for all. Effectiveness in soil removal and tendency toward minimum soil deposition were evaluated by washing cotton cloths, soiled in a standard manner, in both hard and soft water. In addition, foaming capacity and stability of the foam were measured.

When one has found a detergent which washes well, there is still the question of economy. Does it pay to buy the so-called giant economy size? Many advertisers have done a good job, over a period of years, in convincing the consumer that it is more economical to buy a bottled, canned, or packaged item in the "giant economy size" rather than in the "small" or even "large" size. Consumers are so accustomed to believing what they are told by manufacturers that few ever stop to check whether they are in fact getting

more for their money. The consumer who is not above spending a little extra time and using a little arithmetic may often find to his surprise that he makes no saving in purchasing the "big economy package," and that sometimes it may indeed cost more on a per-ounce or per-pound basis when the giant size is purchased instead of one of the smaller ones. It is curious that manufacturers of synthetic detergents do not offer the consumer a significant price advantage when he buys the largest available package. Based on prices charged by a large grocery chain, the figures in the last column of the accompanying table show that, in the case of at least four nationally known and distributed brands of detergents, the consumer saves only a trifling amount—of the order of 3 percent—when he buys the giant package as compared with the large size. In one case (that of *Cheer*), he actually loses 3 percent in the price per ounce by purchasing the big "money-saver" package instead of the "large" package.



Which box is more economical?

Brand	Weight in oz.	Price of box	Price per oz.
All			
24 oz. size	24	\$0.39	1.62c
10 lb. size	160	2.39	1.49
Cheer			
Large	22	0.30	1.36
Giant Economy	51.3	0.72	1.40
Fab			
Large	19	0.30	1.58
Giant Economy	47	0.72	1.53
Rinso			
Large	21	0.30	1.43
Money Saver	44	0.60	1.36
Tide			
Large	19	0.30	1.58
Giant Economy	47	0.72	1.53

The table above shows the prices and sizes and the comparable cost of an ounce of detergent of five different brands of synthetic detergents, for the two larger-sized packages.

A family using a quantity of synthetic detergent each week for laundry and dishes, equivalent to the "large" size box, could save only about 1 cent a week or 50 to 60 cents a year by buying four of the five detergents shown in the table (*All*, *Fab*, *Rinso*, or *Tide*) in the "giant economy" or "money saver" sizes. If *Cheer* were used, it would cost the householder approximately 50 cents more a year to use the "giant" size instead of the "large" size for the same period. While the prices given here may vary in different stores and sections of the country, they are considered to be fairly representative and it is believed that the over-all result would be about the same had the purchases been made in other stores.

Corrections and Emendations to Consumers' Research Bulletins

Polishing and Self-Polishing Floor Waxes An error was made in the listing of *Bright Sail Hard Sheen* self-polishing wax. This wax contained 14% total solids, instead of 11% as given in the BULLETIN.

The 14% figure is well above the 12% minimum set by the Federal Specifications. Tests on new samples indicated significant improvement in resistance to slippage, and slight improvement in

Summary

Performance studies indicated that in soft water *Dash*, *Tide*, *Surf*, and *Fab* were more effective in removing soil than *Ad* and *Vim*. In 15-grain, or hard water, *Tide*, *Surf*, and *Fab* were superior. *Vim* and *Ad*, however, excelled in resistance to redeposition of soil in both soft and hard water; *Fab* was only fair in resistance to redeposition (anti-graying) in both types of water.

Vim and *Ad* gave moderate but unstable foam at normal concentration in soft and hard water. *Dash* produced a moderate amount of foam in soft water but gave practically no foam in hard water. Virtually no foam was produced by either of these three syndets at low concentration in either soft or hard water.

In the listings, the price per ounce paid by Consumers' Research is given in parentheses after the price per box.

A. Recommended

Surf (Lever Bros. Co., New York City) 30c for 1 lb. 3 oz. (price per oz., 1.58c). *Soil removal*, good in soft and hard water. *Anti-graying action*, good in soft water, fair in hard water.

Tide (Procter & Gamble, Cincinnati) 30c for 1 lb. 3 oz. (1.58c). *Soil removal*, good in soft and hard water. *Anti-graying action*, good in soft water, fair in hard water.

B. Intermediate

Ad (Colgate-Palmolive Co., Jersey City, N.J.) 39c for 1 lb. 8 oz. (1.62c). *Soil removal*, fair in soft and hard water. *Anti-graying action*, very good in soft water, good in hard water.

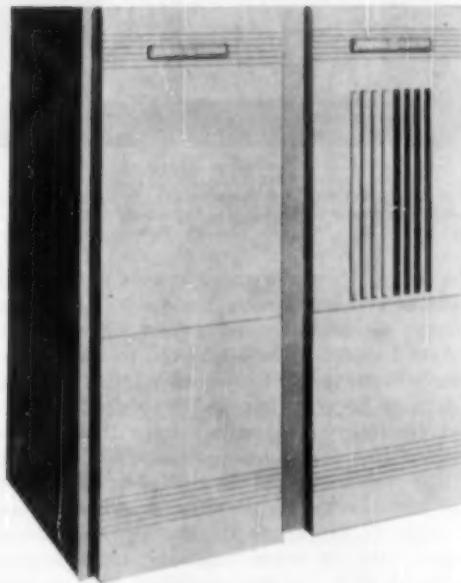
Dash (Procter & Gamble) Price not available. 1 lb. 8½ oz. *Soil removal*, good in soft water, relatively poor in hard water. *Anti-graying action*, good in soft water, fair in hard water.

Fab (Colgate-Palmolive Co.) 30c for 1 lb. 3 oz. (1.58c). *Soil removal*, good in soft and hard water. *Anti-graying action*, fair in soft and hard water.

Vim (Lever Bros. Co.) Price not available. 1 lb. 5 oz. *Soil removal*, fair in soft water, relatively poor in hard water. *Anti-graying action*, very good in soft water, good in hard water.

resistance to soiling and to marking by rubber heels. On the basis of the test of new samples, *Bright Sail Hard Sheen* floor wax now warrants an *A-Recommended* rating. The total solids of the *Aerowax No Rubbing* wax were not given in its listing, but were 11%, and thus slightly below the minimum set by the Federal Specifications. (The rating of *Aerowax* is not changed.)

Central Residential Air Conditioning—I



Courtesy General Electric Co.

Typical heating and air-conditioning combination.

WHILE the primary function of central residential air conditioning is cooling, there are several other advantages that have considerable appeal to householders. With air conditioning, a home or office may be kept closed and so reduce materially the amount of dust and noise. All circulating air is screened through filters for further cleanliness, and the pollen content of the air is thus greatly reduced. Finally, a good deal of moisture can be removed from the air in an average sized home on sultry days. As excessive humidity makes for discomfort and damages clothing through mildew, rusts metals, may warp woodwork and floors and crack plaster, removal of excessive moisture in times of extreme humidity may be advantageous in the preservation of the house and its contents.

General types of equipment available

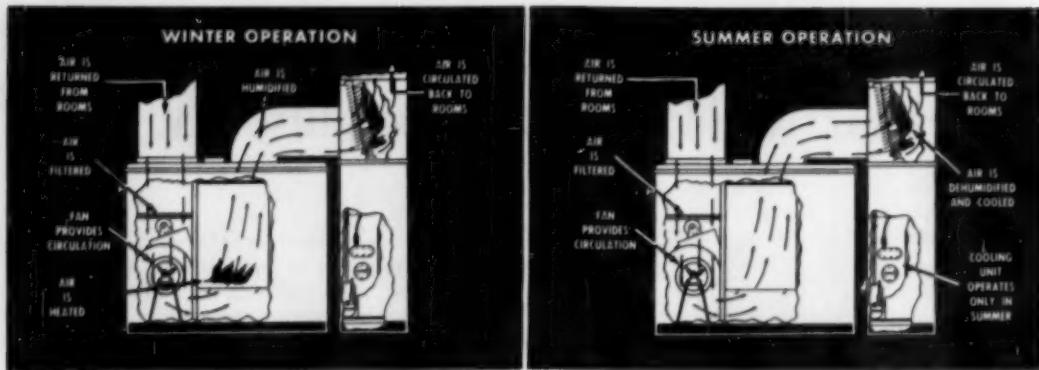
Since it has not yet been found practicable to utilize existing hot water or steam piping and radiators for cooling, all central air-conditioning

equipment uses chilled air as the cooling medium. Thus the majority of installations are made in conjunction with existing or newly-installed forced-warm-air heating systems.

There is a wide choice of models available, such as integrated summer-winter units designed to supply either warm or cool air; cooling units designed for attachment to forced warm-air furnaces of the same make; and separate air-conditioning systems which use the existing system of heating plant ducts. A hot-water or steam heating system is of no use for cooling, and it is necessary to supply a separate cooling unit and duct system to cool a stream of moving air and then distribute it through the house. In a house built over a shallow crawl space or on a poured concrete slab, a horizontal (flat) cooling unit can be located in the attic, and the ducts installed to discharge the cooled air through suitable ceiling registers or registers high on the walls. Similarly, in a one-story house with basement or crawl space, a suspended horizontal unit or an up-flow unit can be installed, and ducts connected to properly located floor registers or registers low on the wall. Installation in a two-story home with a hot-water or steam heating system is much more difficult since the equivalent of an entire warm-air duct system is needed, as with warm-air furnace equipment. One solution is a combination of the two methods suggested above, namely, the installation of one cooling unit in the attic and a second unit in the basement, each connected to a separate one-floor duct system.

The relationship between the heating and cooling loads varies considerably for different areas in the United States. Thus, unless the manufacturer of a combined heating and cooling unit is prepared to offer a very wide range of models, his installations will be restricted to a relatively small sales area. Consumers considering such integrated summer-winter units are well advised to make sure that they are ones that are well adapted for their particular locations. Otherwise, it is advisable to select *separate* heating and cooling units each having the correct capacity for the cold and hot weather requirements of the particular region.

Many manufacturers offer a cooling unit with-



Courtesy Airtemp Div., Chrysler Corp.

Simple illustration showing the manner of operation of an air-conditioning system. The furnace, usually oil or gas fired, in the middle of the diagram above works in the winter. The motor-operated-compressor cooling unit operates only in the summer.

out an air-circulating blower, with the idea that the furnace blower will be used for circulating cooling air. While such use of the furnace blower is generally satisfactory if it has sufficient capacity to handle 400 to 500 cubic feet per minute for each ton or horsepower of compressor capacity ($\frac{1}{8}$ inch of water extra static pressure is required), adequacy of the blower should be carefully checked with the furnace manufacturer before adding an air conditioner. A considerable loss in cooling capacity may result if the blower does not have the needed capacity. If condensation and corrosion problems are to be avoided, the installation should not be applied to an existing system which would require that the chilled air pass over or through the furnace heating elements. (Some manufacturers, however, claim to have solved the problem by applying a ceramic coating to exposed furnace and boiler parts.) Some favor a method which bypasses chilled air around the furnace, usually by suitable duct and damper arrangements, so that it never comes into contact with unused heating surfaces; hence the reference in equipment listings to the availability of dampers. In this same connection it should be noted that protection by a ceramic coating cannot be afforded to parts already installed. This again adds emphasis to the desirability of separate warm and cold air paths through the system when adding air conditioning to an existing heating plant.

While central air conditioning may seem to be a very desirable asset to one's home and living comfort, a few words of caution are in order. Practically, cooling equipment in a new home constructed to accommodate a central cooling and heating plant is likely to give far more satisfactory results than equipment installed in an

older home; there are many houses, not too old, in which a cooling system could not be made to function satisfactorily. Further, since such a combined system is best adapted to those areas where winters are not too severe although summers may be very hot and humid, there is a good possibility that a monetary loss will be incurred if an air-conditioned house in the northern and cooler states of the United States is sold, since purchasers may consider that they would not wish to pay much for the air-conditioning feature. By the same reasoning, there is good likelihood that, as the combined heating-and-cooling systems become more popular in the southern areas, a loss will result if a relatively new house in the \$15,000 or higher bracket lacks air-conditioning equipment of good make and reputation.

When properly used, the term "air conditioning" implies the simultaneous control of temperature, humidity, and air circulation, plus a degree of filtration. It should not be confused with such terms as "air-cooling" nor should it be applied to evaporative-type coolers which are capable of functioning satisfactorily only in certain areas of the United States where the relative humidity is low—in the 20 to 50 percent range—at those times when air cooling is desired. As the humidity of the outside air increases in hot summer weather, an evaporative-type cooler becomes less and less effective in lowering air temperature within a dwelling. There are also some so-called air conditioners on the market which are essentially forced warm-air heating systems in which provision has been made to operate the blower in the summertime and merely circulate the warm air in the house or to pull cool air from a basement and circulate it through the house. These are unlikely to be

of much value in cooling a home and their purchase will usually prove to be a disappointment, and a waste of money.

Water-cooled units

Water supply

The vast majority of central air conditioners differ from the more familiar window-mounted air-cooled conditioners in one very important respect, namely, the central systems use water rather than air as the medium for the ultimate removal of heat from the premises. This creates at least four problems which do not have to be considered in air-cooled models:

1. Cool water must be supplied at the relatively high rate of 60 to 100 gallons per hour for each horsepower (ton¹) of air conditioner capacity.

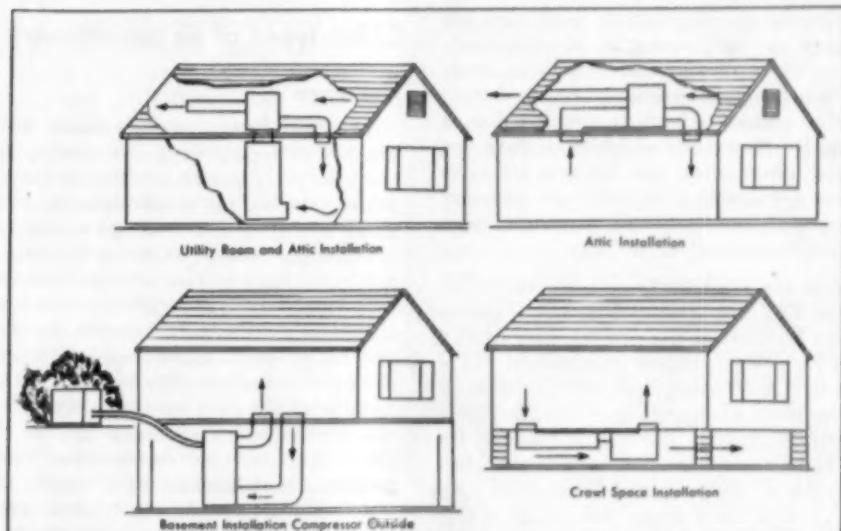
¹A ton of cooling capacity equals the chilling power of a ton (2000 pounds) of ice melting in a 24-hour period (removal of 288,000 Btu).

2. Adequate means of disposal must be provided for this water as it is discharged from the unit.

3. Unless the equipment is specially designed for easy cleaning internally, and kept clean, scale and residue from the water will, in time, impair operation in most locations.

4. If the water system is exposed to the elements, all components containing water must be drained in freezing weather.

In view of a generally reduced ground water supply (falling water table) in many parts of the country and inadequacy of water supplies in others, an increasing number of municipalities have been forced to place restrictions on the use of city water for air conditioning. Other cities and towns are likely to adopt such regulations at any time, without advance notice. Thus the owner of a properly installed water-cooled air conditioner may often face the need for expen-



Courtesy Airtemp Div., Chrysler Corp.

Drastic architectural changes are not required to bring air conditioning into any existing home having forced warm-air heating, as evidenced by these four basic applications in residential air conditioning.

Upper left: Ranch-type home with storage attic usually can accommodate this installation. Furnace is in the utility room on the main floor. Air is routed upward into the air conditioner, then into ducts for distribution through ceiling registers.

Upper right: Similar to the upper left diagram, but in this case a horizontal furnace

is used in the attic. In both applications, air used to cool the refrigerant is circulated through the attic, reducing attic temperatures and consequently the home's cooling load.

Lower left: This is the most popular air-cooled installation. The condensing unit is located outdoors. The cooling coil is placed in the furnace air discharge duct.

Lower right: The combination horizontal furnace and air-conditioner system is installed under the house in the crawl space. Sufficient air to cool the refrigerant usually is available here.

sive changes long after the installation has been put into use. As an alternative to the full use of city water, a municipality may allow the installation of an evaporative-type cooling tower. With such a system, water consumption is greatly reduced and no extra load is imposed on the sewer system. In locating cooling towers (which have certain troubles and disadvantages of their own), it is important always to place them in the unobstructed path of prevailing breezes. Leaves, dirt, etc., cause clogging and call for more frequent cleaning.

Water disposal

The availability of an adequate means for disposal of the cooling water should also be investigated. Most communities have two sewerage systems: sanitary sewers, for the disposal of wastes; and storm sewers, for the drainage of surface water. As sanitary sewers are seldom designed for the large water volumes that would result from any widespread use of water-cooled air conditioners, city regulations may prohibit connecting an air-conditioning plant to the sanitary sewer. Storm sewers can usually be used, especially since they are normally empty during the hot, dry periods when air conditioning is most needed. However, as storm sewers are drainage-fed, there may not be one on each street; thus a connecting pipe to a storm sewer may be required, and that could be so long as to be prohibitively expensive.

In view of the need for both adequate water supply and sewerage connections, CR suggests that inquiry be made at the city engineer's office before buying a water-cooled conditioner. It is well to ask if any restrictions are planned or are likely to be promulgated, as well as to check on current regulations. The city of Denver, for example, has recently ordered the use of water-saving devices on thousands of existing air conditioners in a drastic move to reduce water consumption in the city.

Air-cooled conditioners

In order to get away from the rather serious disadvantages of water cooling, several manufacturers (such makers as Carrier, Chrysler, General Electric, and Muncie Gear Works) are now offering large coolers in which air is used as the medium for removing the heat. Although the problems of water supply and disposal are eliminated, these appliances introduce new dis-

advantages, such as increased bulk, somewhat higher consumption of electricity, the need for proper venting of very large quantities of heated air, and a progressively decreasing cooling capacity of the air conditioner as the outdoor temperature rises.

Although the terms horsepower and tons may be considered synonymous when speaking of a water-cooled unit, a 2 horsepower air-cooled unit will produce only about 1.75 tons of actual refrigeration with 95°F outdoor temperature, and 1.60 tons at 105°F outdoors. Similarly, a 3 horsepower unit can be expected to produce 2.75 tons at 95°F and 2.6 tons at 105°F. Thus, when making a choice, one should compare the capacities of the two types of units in *tons of refrigeration* rather than their horsepower rating. Nevertheless, if there is any question about either adequacy of water supply or capacity of the sewerage system to handle the cooling water, it would be wise to consider an air-cooled model.

Other types of air conditioners

Heat pump

The heat pump (see *Typhoon*, for example, which will appear in a forthcoming BULLETIN) operates on a principle entirely different from other complete air conditioners in that heat is either added to (for cooling) or extracted from (for heating) large quantities of water and thus will either heat or cool a home as needed. The only "fuels" needed for either winter or summer operation are the electricity for the compressor, and an adequate water supply. Since water is the principal source (for heating) or outlet (for cooling) of the heat exchange, water and sewerage problems are so much greater than even those described for conventional water-cooled units that an *abundant* water supply at low cost is definitely a requisite to the use of a heat pump. Costs of the equipment are high as compared with the other types of conditioners, and it would be wise to make careful inquiry as to the cost complete with installation before deciding upon the purchase of units of this kind, as the amount may be very substantial.

* * *

Part II of this article, which will appear in a forthcoming BULLETIN, includes a discussion of the size of air-conditioning unit needed, costs of equipment, operating costs, and listings of several units.

Stereoscopic Photography

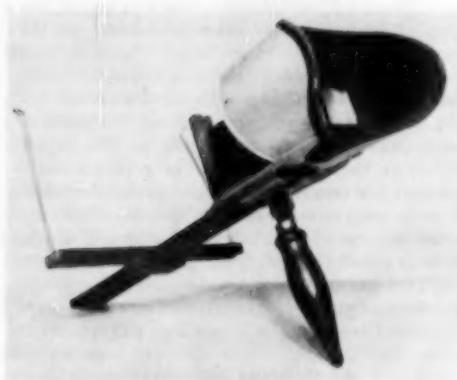


Figure 1

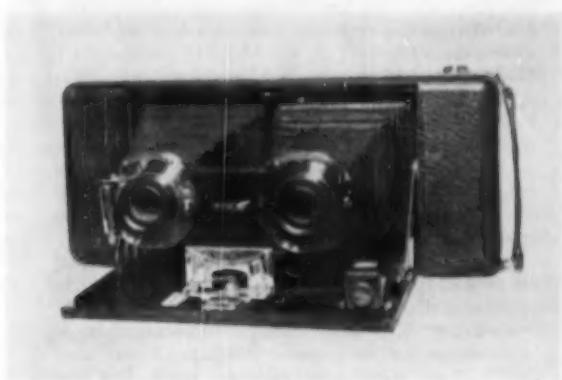


Figure 2

THE VIEWING of stereo or 3-dimensional photographs was very popular around 1890-1925, and there were millions of American homes which had a viewer such as is shown in Figure 1, through which the pyramids, the Sphinx, street scenes in Cairo and other great cities of the world were viewed with the realism which can only be provided by a picture which shows solidity and roundness in the objects viewed. An early Kodak stereo camera was produced in 1901. It resembled two *Brownie* box cameras set side by side. There were other models up to 1924, including the *Stereo Kodak Model 1*, similar in appearance to the camera shown in Figure 2. There were many foreign stereo cameras produced, some of which were of very fine design and workmanship. Some of these were the *Stereoflescope*, *Heidoscope*, and *Rolleidoscope*, but most of the cameras of this era used glass plates fed into position by a plate magazine. Some used film pack or roll film to produce stereo pairs. The pictures most common were about $2\frac{1}{4}$ inches square (60 mm.), but there was another size, about $1\frac{3}{4}$ inches square (45 mm.).

The popularity of stereo waned because of the extra expense, and the careful workmanship required in mounting the pictures so that they could be seen without eyestrain. Then with the arrival of 35 mm. color film at moderate prices, interest in stereo began to revive, because the combination of color with solidity in the scene produced an extremely high degree of realism, unequaled in any photographic medium hitherto available.

In the last few years, there has been an attempt to popularize 3-dimensional movies as a means of improving the somewhat lagging mo-

tion picture business. These were popular for a time, but their popularity too has waned, chiefly because of poor technical performance and the inconvenience of having to wear glasses of an unsatisfactory kind made of a polarized plastic to view the pictures.

At the present time, color stereo slides are very popular, and there are many devices made to view these; many 35 mm. stereo cameras are offered by makers in this country and abroad. Probably there are no reliable figures available on the extent of use of stereo cameras, although some think there may be as many as 100,000 now in use in the United States.

Sears, Roebuck & Co. have recently introduced a low-priced stereo outfit for black-and-white pictures. Two box cameras are attached to a mounting bar which spaces the lenses the proper distance apart. The outfit, at \$17.50, consists of two *Tower Jr.* box cameras, a mounting bar, two rolls of No. 127 film, two dozen mounting cards, paper cement, an alignment sheet, and a viewer. Each picture of the pair is $1\frac{5}{8} \times 2\frac{1}{2}$ inches. The cameras can be detached and used separately for ordinary picture taking if desired.

A-

Revere Stereo 33 (Revere Camera Co., Chicago)
\$174.50. Came, \$12.50; flash gun, \$15.

A very good camera which produced excellent color stereo slides, the shutter speeds were not as accurate as desirable.

Film: Regular 35 mm. film, or *Kodachrome* stereo color film at \$4.65 per roll, including processing and mounting; the latter gives 20 pairs per roll. Size of each frame of the stereo pair, $13/16 \times 15/16$ in. (21 x 24 mm.).

Lenses: *Wollensak Anaston f/3.5*, coated, of 35 mm. focal length. Focuses from 3 ft. to infinity by knob (marked with a depth of field scale) which moves the film plane while the lenses remain stationary. Built-in filter-retaining-rings which act with deep-set lenses as lens shades.

Shutters: Coupled together with rated speeds of 1/200, 1/100, 1/50, 1/25, 1/10, 1/5, 1/2 sec., time, and bulb. Built-in synchronization for Class M for speeds up to 1/25 sec., Class F lamps for speeds up to 1/100 sec., and Class X (electronic flash). The camera has the important disadvantage that only the *Revere* flash gun can be used with it. Coupled range-finder of super-imposed-image type. Winding the film cocks the shutter. Provision for prevention of double exposures; also provision to permit the making of double exposures when desired.

View-finder: Eye level, "optical" (telescope) type with correction for vertical parallax. View-finder has built-in spirit level; correct leveling of the camera is a necessary step in stereo photography.

Body: Metal, leather covered of attractive appearance. Has daylight color exposure guide on the bottom of the camera and loading instructions printed inside the camera.

Test results: The camera was easy to operate, well designed, and constructed. Lens resolution was good. Shutter speeds of 1/10 sec. and 1/50 sec. were within permitted tolerance, but at 1/50 sec., one shutter was 10% fast and the other was 20% fast; at 1/25 sec. both shutters were inaccurate beyond the tolerance (actual speed about 1/20 sec. for both shutters).

B

Kodak Stereo (Eastman Kodak Co., Rochester 4, N.Y.) \$84.50. Case, \$9.50; flash holder, \$7.95; viewers, \$12.75 and \$23.75.

Film: Regular 35 mm. film gives 16 stereo pairs on 20-exposure roll at \$3.25 which includes processing, but not mounting—for which there is an extra charge of \$1 per roll. A special *Kodak* stereo film at \$4.65 per roll gives 20 pairs per roll; this price includes processing and mounting. Size of each frame of the stereo pair, 13/16 x 15/16 in. (21 x 24 mm.).



Kodak Stereo

Lenses: *Kodak Anaston f/3.5* of 35 mm. focal length (triplet construction). Lenses are coupled together and focused by turning either front element lens mount, from 4 ft. to infinity. One lens mount has a depth of field scale, the other is marked for three zones of focusing—"close ups," "groups," and "scenes." Built-in filter-retaining rings.

Shutters: Coupled together with rated speeds of 1/25, 1/50, 1/100, 1/200 sec., and bulb, set by means of a sliding bar on the top of the camera. Winding the film cocks the shutter, which is synchronized for flash and has means for preventing double exposure. There is an exposure selector which indicates the correct stop for the shutter speed selected; the user moves a pointer to "Bright," "Hazy," or "Cloudy Bright."

View-finder: Eye level, "optical" (telescope) type which is centered between the lenses and requires no correction for parallax. This and the zone focusing already referred to would seem to be desirable features on a camera for use by amateurs with limited experience. Spirit level for horizontal alignment (vitally important in stereo photography).

Body: Made of plastic.

Test results: The camera was easy to operate except for selection of shutter speeds by means of the sliding bar, which was rather hard to set. The lens resolution was only fair. Beyond 5° from the optical axis of the lens, resolution fell off, and was below 20 lines per mm. at 20°. One lens showed noticeably better over-all correction than the other. The shutter speeds were within permitted tolerances. Plastic body not likely to be very durable.

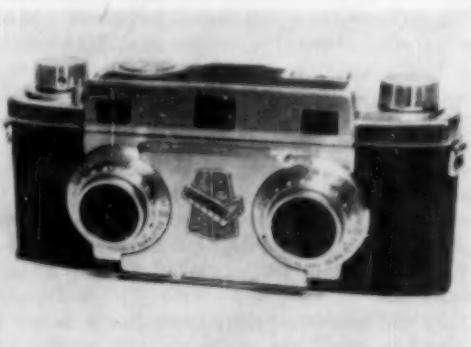
C

TDC Stereo Colorist (TDC Div., Bell & Howell Co., Chicago) \$100. Made in Germany.

Film: Regular 35 mm. film or *Kodak* stereo color film which gives 20 pairs per roll. Size of each frame, 13/16 x 15/16 in. (21 x 24 mm.).

Lenses: *Rodenstock Stereo-Trinar f/3.5* coated of 35 mm. focal length. Lenses are coupled together and focused by rotation of either front lens element, from 3 ft. to infinity.

Shutters: *Stereo-Velvo*, coupled together with rated



Revere Stereo 33

speeds of 1/10, 1/25, 1/50, 1/100, 1/200 sec., and bulb. Built-in flash synchronization, but has the disadvantage already mentioned in connection with the *Revere* of using only a special flash unit supplied by the maker of the camera. Provision for prevention of double exposures.

View-finder: Eye level, "optical" (telescope) type not corrected for vertical parallax. Had built-in level bubble.

Body: Die-cast aluminum. Loading instructions on camera back.

Test results: The camera was easy to operate, but the film advance mechanism was poor, and some stereo pairs overlapped. Resolution was only fair at full aperture; both lenses had considerable astigmatism at apertures from f/3.5 to f/5.6. Shutter speeds were within permitted tolerances.

* * *

The following stereo cameras have been previously reported by CR and are again reported here in abbreviated form for the convenience of our readers.

A-

Stereo Realist (Realist, Inc., Milwaukee 12) \$159. Viewer, \$20; mounting kit, \$29.50. Coated f/3.5 *Cooke Anastigmat* lenses of 35 mm. focal length, of fairly good quality, in synchronized shutter. Takes 16 stereo pairs on standard 20-exposure roll of 35 mm. perforated film; 29 pairs on 36-exposure roll; 20 pairs on *Kodak* stereo color film.

B

View-Master Personal (Stereocraft Engineering Co.,

distributed by Sawyers Inc., Portland 7, Oreg.) \$140. Case, \$12.50; viewer, \$2; film cutter for mounting stereo pairs, \$19.50. 37 stereo pairs on standard 20-exposure 35 mm. roll, perforated film; 69 pairs on 36-exposure roll. Picture size, about $\frac{1}{2} \times \frac{3}{4}$ in. (13 x 13 mm.). Fixed-focus coated f/3.5 anastigmat lenses of 25 mm. focal length, of fairly good quality.

B-

Linex (Linex Corp., Div. of Lionel Corp., N.Y.C.) \$44.50, with case, viewer, and 1 magazine of color film. Makes 8 stereo pairs on a special-size (non-standard) film; pictures very small—9/16 x 5/8 in. (14 x 15 mm.). Fixed focus. Quality of lens, poor. Pictures of about the grade supplied by the smallest non-focusing box cameras; grain very noticeable. (Fuller information in August 1954 BULLETIN.)

Stereo viewer

A. Recommended

Kodastlide Stereo Viewer II (Eastman Kodak Co., Rochester, N.Y.) \$23.75. Takes standard stereo mounts (1 1/8 x 4 in.). Operates on 115 volts, with built-in brightness control. Easily converted to use two D-size batteries. Color corrected achromatic lenses with interocular-distance adjustment; built-in switch; focused by movement of slide carrier. An excellent viewer. Eastman's *Stereo Viewer I* at \$12.75 had similar features, except that it had the much less desirable uncorrected lenses and the viewer was for battery operation only.

Abridged Cumulative Index of Previous 1955 Consumers' Research Bulletins

Month	Page	Month	Page	Month	Page
Advertising, featured items, availability†	Feb., 4	Editorial	each issue, page 2	Saws, electric, portable	Jan., 5-10
Appliance testing	Jan., 2, 24-26	Electricity, static	Feb., 27-28	Sewing machines, Japanese, export controls	Feb., 3
Appliances, defective, adjustments, discount prices	Jan., 3	Flowers, cut, proper care	Feb., 23	Shirts, men's white dress, Sizing?	Jan., 11-15
Automobiles, 1955†	Jan., 33	Freezer-food plan vs. supermarket prices	Jan., 3	Sliding, redwood, cedar, finishing?	Feb., 21-23
MG "TF" 1950, Pontiac Star Chief V-8 Hydra-Matic	Jan., 21-24	Furniture, informative labeling	Jan., 3	Soup mixes, dehydrated, restaurant use	Jan., 4
Buick Special Dynaflow, Chevrolet V-8 Bel Air Powerglide, Chevrolet 210 Six with over-drive, Ford V-8 Customline, Ford V-8 Fairlane Fordomatic, Plymouth Belvedere V-8 PowerFlite, Studebaker Champion Deluxe	Jan., 5-12, 23	Gloves, household	Feb., 16-18	Suits, men's, alteration charges	Feb., 19-20
Batteries, mercury-type hearing aid, disposal hazard	Feb., 3-6	Hangers, shelf	Jan., 34	Sweater, poor washability†	Feb., 19
Blankets, electric, repair service	Feb., 4, 23	Hearing loss and hearing aids	Feb., 13-15	Table, "wrought iron," TV	Jan., 26
Boric acid, poisoning hazard	Jan., 4, 33	Instruments, hospital, possible errors	Jan., 29	Telephone handsets and telephone accessories	Feb., 24-26
Carpets, tufted, popularity	Jan., 4	Lemons, price	Feb., 3	Television, color programs, high cost	Feb., 3
Chemical products, household, hazards	Jan., 3-4	Mattresses, sales stimulation technique	Feb., 33-34	effect on family life	Jan., 4
Coffee, high prices	Jan., 18	Meat, frozen, quality after thawing, refreezing	Feb., 4	Tire gauges?	Feb., 29-30
Corrections and emendations†	Jan., 28	Motion pictures†	each issue	Vacuum cleaners?	Jan., 16-20
Earrings, clip-on, ear lobe damage	Feb., 4	Paintbrush cleaner	Jan., 34	Vitamins, excessive intake, harmful	Feb., 3
Penicillin shots for colds, ineffective	Jan., 4	Penicillin shots for colds, ineffective	Jan., 4	Water, fluoridation, review of pamphlet	Feb., 26
Platoia, air†	Jan., 27-28	Potato baking racks	Feb., 28	Windshields, proper cleaning important	Feb., 18
Radio receivers, "all-wave"†	Jan., 29-30	Records, phonograph	each issue		
Refrigerators, automatic defrosting, problem	Jan., 3	Refrigerators, automatic defrosting, problem	Jan., 3		
Rust remover, liquid†	Feb., 28-29	Rust remover, liquid†	Feb., 28-29		

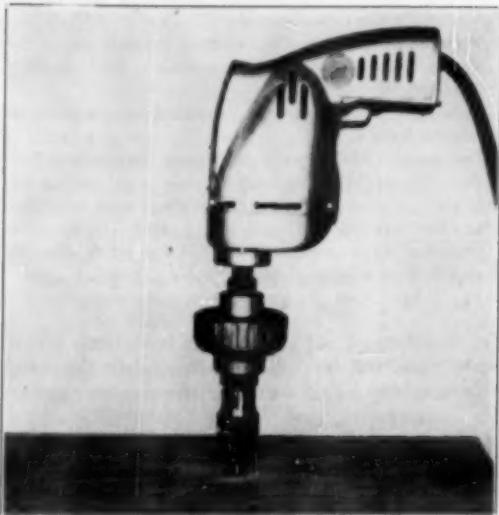
Indicates that listings of names or brands are included.

Speed Reducer for Electric Drills

WITH so many attachments available to be used with it, the quarter-inch electric drill has become the jack-of-all-trades in many a home workshop. Quarter-inch drills with attachments are used for sawing, sanding, grinding, polishing, wood turning, hedge clipping, and, of course, for drilling holes in wood, plastic, and metal. While adequate for occasional light duty in the varied uses mentioned, the quarter-inch drill with attachments is not nearly as versatile as a set of individual power tools, nor can it stand up so long under heavy loads and hard usage.

One accessory which will make a small drill somewhat more versatile is a speed reducer. The *Babco 5 to 1 Speed Reducer* is claimed to be useful in drilling, nut running, screw driving, masonry drilling, etc., and may also allow a quarter-inch capacity electric drill to be used with a half-inch capacity chuck. The *Babco* would thus be a useful device for a person having only occasional need for the slower speed and higher torque of a $\frac{1}{2}$ -inch power drill, and is, of course, a relatively inexpensive way of obtaining these advantages, compared with buying the larger drill. A speed reducer might also be useful with some of the other drill accessories, although for most operations, such as sawing, sanding, and polishing, maximum speed is desirable.

The *Babco 5 to 1 Speed Reducer* was found to give an actual speed reduction of $4\frac{1}{4}$ to 1 with an accompanying increase in stalling torque of about $3\frac{1}{2}$ to 1. It is useful in drilling with large bits or in masonry drilling, but its usefulness in nut running and screw driving seemed rather limited. In CR's recent tests of portable electric drills (CONSUMERS' RESEARCH BULLETIN, February 1954) the no-load speed of quarter-inch drills ranged from 1150 to 2320 rpm., the average of all drills tested being 1800 rpm. The speed reducer attached to even the slowest drill ran too fast to allow satisfactory control in driving screws with only a screw driver bit. A "finder sleeve" is available as an accessory for screw driving but was not tested by CR. This sleeve would no doubt help, for without it, if the drill were not held just right, the screw driver would slip out of the screw slot and mark the surface of the work badly. Unless a good many screws were to be put into soft wood, the time taken to attach the reducer and screw driver to the drill would often be more



The Babco 5 to 1 Speed Reducer is attached between the spindle and the chuck of a quarter-inch drill. It may also be used with an adapter attached directly to the drill's chuck, and a second chuck used to hold the bit.

than that necessary to drive the screws in the usual way. This also applies to nut running, where the very high price of the shank and hexagon sockets sold as accessories for the speed reducer, and the time required to set it up would make nut running by hand the better choice except in unusual circumstances.

The *Babco* speed reducer has "hand clutch control" in which the case of the reducer must be held still to make the chuck turn at the reduced speed. The speed reducer should be grasped firmly *before* starting the drill; it is best not to try to take hold of the reducer while it is turning fast, to avoid risk of a "friction burn." If the bit has no load and the case of the reducer is released, both will revolve at full drill speed. If the case is released when there is a heavy load on the bit, the bit will stop and the body of the reducer will revolve. This manner of operation is a safety feature to a certain extent, but it also makes it necessary to use both hands while drilling. The method of operation also makes it impracticable to use the speed reducer for long periods of drilling, as the case of the reducer became too hot to hold after 2 to 3 minutes of drilling or 3 to 4 minutes running without load.

B. Intermediate

Babco 5 to 1 Speed Reducer (Babcock Mfg. Co., 6253 Claremont Ave., Oakland 18, Calif.) \$9.95, with 3 adapters to fit different chucks. Gives a $4\frac{1}{4}$ to 1 speed reduction and increases stalling torque $3\frac{1}{2}$ times. A useful and practical accessory for a $\frac{1}{4}$ -in. power drill, in certain circumstances, but CR considers it probable that the average home crafts-

man would not have more than occasional need of such a special device. Accessories available for use with the speed reducer include $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. chucks, adapters to fit the chucks to the speed reducer, screw driver bits for slotted and Phillips screws, finder sleeves for use with the screw drivers, and $\frac{1}{4}$ -in. square drive hexagon sockets and shank for nut running.

Printed Electronic Circuits

ONE of the newer developments in the electronics industry today is the "printed circuit." The use of printed circuits in electronics has revolutionary possibilities, not only because it permits manufacturers to produce small and extremely rugged electronic components, but also because it reduces the production of the components to simple and rapid mechanical operations with a minimum of detailed manipulation, soldering, etc., by skilled operators, and so substantially lowers manufacturing costs. According to the National Bureau of Standards, there are upwards of 26 different methods of producing these new circuits. Most are based on essentially the same principle, that of printing a trail of a conducting material on an insulated backing plate; in some cases the conductive material is sprayed on; in some it is "dusted" on; and in others it is deposited from a chemical bath.

The most widely used method is that of painting the circuit on the backing. The paint can be brushed on by hand, although in mass production operations, a sort of stenciling process is more often used. The paint used for producing an electrical conductor usually consists of a powdered metal, such as copper, suspended in a liquid. This is applied to the surface of the insulated base to form the "wires" of the circuit. Other paints of different characteristics, made of resistive materials such as carbon, may be used for resistors. Condensers may be made by printing the plates on opposite sides of a base sheet, or by coating a layer of conductive paint on the base, applying a thin insulating layer, and putting another conductive coating on top of the insulating layer. When all the components have been painted and placed, the entire assembly is fired and baked at a high temperature; this process fuses the metal particles together and bonds the circuit to its base. This system of printing, especially with the stenciling type of process where the entire circuit has been

laid out ahead of time on a master stencil, is a very fast single-stroke affair. An entire circuit or even the entire wiring and components of a TV or radio (except tubes and power transformers) can be produced in a very short time with a great saving in time and labor.

Many radio and television manufacturers advertise nowadays that they are using printed electronic circuits in their products. The individual circuits have resistors, condensers, and

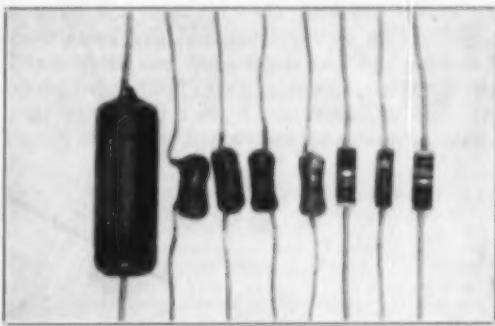


Figure 1—These five condensers and three resistors—shown nearly full size—were replaced by the printed circuit, of Figure 2. Saving of space is evident.



Figure 2—Printed audio output stage (couplate) shown nearly full size mounted in a small 5-tube ac-de radio, as a part of its original construction.

wiring of a single circuit of the radio or TV plated on a backing material in one compact unit. The use of these individual circuits does not include all the potential advantages that would be had by printing the entire circuitry in TV or radio. In the printed unit, a complete single circuit such as the audio-coupling components are sealed together with their own wiring into a single unit, and only the terminals or connecting leads are exposed.

The *Couplate* (in Figure 2), as it is called by a large manufacturer of such components, replaces three resistors and five condensers and their associated wiring. Such a circuit element means lower cost to set manufacturers and should in time imply lower selling prices for radio and television sets. There is—as with most improvements—a disadvantage in that repairs could be more expensive, especially if the serviceman must take the time to locate a faulty part in the compact printed circuit element. The retail price of the *Couplate* is \$1 as compared to about \$2 for the separate components, but if the serviceman charges for time spent hunting for a bad part and then ends up anyway by replacing the entire *Couplate*, the customer will have a larger bill for service labor and part costs than if the set had had the normal components and wiring. With individual instead of printed parts, the time to locate and replace the faulty part would be less, and the charge would be lower,

since only one resistor or condenser would have needed replacement. If it should happen that the set will need servicing, there is a good chance that the initial saving on a set made with printed circuits will be nullified with increased service costs over the useful life of the set. The savings through use of printed circuits are thus potentially ones that may accrue chiefly to the manufacturer rather than the consumer.

The one sure advantage of individual printed circuits as far as the consumer is concerned is the small space occupied by such units and the reduction in over-all size and weight of a radio or television set or hearing aid that the design makes possible. Some radio sets today have all the wiring etched or plated on the chassis.

With progress in manufacturing techniques, the entire electronic circuits of radio and television sets and of hearing aids, with the exception of the vacuum tubes and transistors, may in future years come to be of the printed type. With that development, it is to be expected that the savings achieved by mass production and the action of competition will make the price of the printed circuits low enough so that their use may reduce costs of servicing rather than increase them—because the serviceman will be able to replace an entire section cheaply without need to spend time hunting for the individual parts that may have developed defects.

Source for Low-Priced Photostats

FOR the benefit of those of our readers who have occasional need for Photostats, as many persons do, we are again calling attention to the availability of a cheaper-than-usual source for $8\frac{1}{2} \times 11$ Photostats. The present cost is 18 cents each—with the limitation that there is a minimum charge on any order of 25 cents, and there is a charge of 25 cents for a change of size from the original.

The firm making available this service is Mathias & Carr, Inc., P.O. Box 134, Church St. Station, New York 7. Work received at their post office box by 2 P.M. will be processed and sent out on the same day. Discounts are

allowed for orders amounting to more than \$50.

We have been assured that documents mailed to this company will be treated in strictly confidential fashion; the firm has been cleared to handle classified governmental material. Remittance for the work, including return postage, is to be sent with the order; the amount of the remittance for return postage should be twice the amount that was paid for mailing the prints to Mathias & Carr. Thus, if postage needed to send the original document was 6 cents, it would be necessary to enclose 12 cents postage with the order and the original document, for its return with the Photostats.

Ratings of Motion Pictures

THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines — some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, Cine, Daily News (N. Y.), The Exhibitor, The Farm Journal, Film in Review, Harrison's Reports, Joint Estimate of Current Motion Pictures, Motion Picture Herald, National Legion of Decency, Newsweek, New York Herald Tribune, New York Times, Parents' Magazine, Release of the D. A. R. Picture Committee, Reviews and Ratings by the Protestant Motion Picture Council, The Tablet, Time Weekly (biweekly).

The figures preceding the title of the picture indicate the number of critics who have been judged to rate the film A (recommended), B (intermediate), or C (not recommended) on its entertainment values.

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adventure	moi—melodrama
biography	mar—melodrama
in color, (Anco, Eastman, Technicolor, Warner Color, etc.)	mys—mystery
cartoon	nos—dramatization of a novel
comedy	rom—romance
cri—crime and capture of criminals	sci—science fiction
doc—documentary	soc—social problem drama
dr—drama	tran—travelogue
fan—fantasy	war—dealing with the lives of people in wartime
hist—founded on historical incident	west—western
A B C	
— 2 1	Abbott and Costello Meet the Keystone Kops
3 12	Adventures of Hajji Baba, The
1 4	Affairs of Messalina, The (Italian)
7 6	Africa Adventure
3 7	Aida (Italian)
7 2	Americano, The
5 3	An Inspector Calls (British)
4 —	Angelika (German)
1 9	Animal Farm
12 4	Athena
2 6	Atomic Kid, The
	<i>com AYC</i>
1 5 1	Bad Day at Black Rock
2 5	Bamboo Prison, The
4 5 10	Barefoot Contessa, The
5 1	Battle Cry
4 1	Battle Taxi
9 2	Beachcomber, The (British)
4 13 2	Beau Brummell
5 —	Belle of St. Trinian's, The (British)
7 8	Bengal Brigade
7 11	Betrayed
— 3	Big Chase, The
5 7	Black Dakotas, The
9 6	Black Knight, The (British)
2 8 4	Black Shield of Falworth, The
2 6	Black 13 (British)
	<i>com A</i>
	<i>mel—AYC</i>
	<i>war-dr-c A</i>
	<i>dr-c A</i>
	<i>war-dr-c A</i>
	<i>war-mel AY</i>
	<i>mel-c A</i>
	<i>hist-dr-c A</i>
	<i>war-dr A</i>
	<i>dr-c A</i>
	<i>war-dr-c A</i>
	<i>war-mel AY</i>
	<i>com A</i>
	<i>mel—AYC</i>
	<i>war-mel-c A</i>
	<i>cri—mel A</i>
	<i>hist-mel-c AY</i>
	<i>adv-c AYC</i>
	<i>adv-c AYC</i>
	<i>cri—mel A</i>

A	B	C		
—	6	5	Black Tuesday	... mel A
—	12	4	Black Widow	... mys-mel A
1	6	2	Bob Mathias Story	... biog AVC
—	8	1	Bounty Hunter, The	... wes-c A
—	1	3	Bowery Boys Meet the Monsters, The	... com AVC
—	1	3	Bowery to Bagdad	... com A
—	10	2	Bread, Love and Dreams (Italian)	... com A
5	9	1	Bridges at Toko-Ri, The	... war-dr-c A
2	8	8	Brigadoon	... mus-com-e AVC
6	9	2	Broken Lance	... wes-c AV
—	3	11	Bullet is Waiting, A	... cri-mel-c A
—	2	1	Calling Scotland Yard (British)	... cri-mel A
—	1	7	Cannibal Attack	... mel-c AVC
6	7	6	Carmen Jones	... mus-mel-c A
—	3	3	Carolina Cannonball	... com A
—	6	8	Cattle Queen of Montana	... wes-c AVC
—	1	2	Cavalcade of Song (Italian)	... mus-dr A
2	2	—	Cinerama Holiday	... trav-c AVC
—	1	2	City Stands Trial, A (Italian)	... cri-mel A
1	2	1	City Story	... soc-dr AVC
—	2	4	Companions of the Night (French)	... soc-dr A
7	9	1	Country Girl, The	... dr A
—	10	7	Crest of the Wave (British)	... war-dr AVC
—	1	9	Crossed Swords	... adv-c A
—	5	1	Cry Vengeance	... cri-mel A
—	6	2	Daughters of Destiny (French)	... dr A
—	7	7	Dawn at Socorro	... wes-c A
—	4	1	Day of Triumph	... dr-c A
4	7	6	Deep in My Heart	... mus-biag-c A
3	7	7	Desirée	... hist-dr-c A
—	5	1	Desires (German)	... soc-dr A
—	2	4	Desperate Decision (French)	... dr A
—	3	3	Desperate Women, The	... soc-dr A
—	5	4	Destry	... wes-c A
1	9	6	Detective, The (British)	... mys-mel A
—	1	5	Devil's Harbor (British)	... mel AVC
—	4	9	Diamond Wizard, The (British)	... cri-mel AVC
—	3	—	Doctor in the House (British)	... com-c A
—	9	2	Down Three Dark Streets	... cri-mel AV
—	14	5	Dragnet	... cri-mel-c AVC
—	8	6	Drum Beat	... mel-c AY
—	5	7	Duel in the Jungle	... mel-c A
—	5	6	Earrings of Madame De, The (French)	... dr A
—	5	5	Edge of Divorce (British)	... soc-dr A
3	8	6	Egyptian, The	... dr-c A
—	6	1	Far Country, The	... mel-c A
—	2	3	Fast and the Furious, The	... mel A
—	3	10	Fire Over Africa	... mys-mel-c AV
—	6	8	Four Guns to the Border	... wes-c A
—	2	3	Four Ways Out (Italian)	... cri-mel A
1	11	1	Francis Joins the Waco	... com AVC
—	7	2	French Touch, The (French)	... com A
—	6	—	Fuas Over Feathers (British)	... war-dr AV
—	6	6	Gambier from Natchez, The	... mel-c A
—	3	4	Game of Love (French)	... dr A
—	1	3	Garden of Eden	... dr-c A
3	9	4	Garden of Evil	... dr-c A
6	2	2	Gate of Hell, The (Japanese)	... dr-c A
—	7	6	Golden Mistress, The	... mel-c A

A	B	C		A	B	C		
—	2	1	Good Die Young, The (British)	cri-mel A	—	6	8	Ring of Fear
—	9	2	Green Fire	dr-c A	—	2	3	River Beat (British)
—	5	4	Green Scarf, The (British)	mys-mel A	—	7	9	Rogue Cop
—	1	3	Half a Century of Songs (Italian)	mus-dr-c A	14	2	1	Romeo and Juliet (Italian)
—	2	1	Half Way to Hell	war-doc A	—	5	4	Roogie's Bump
2	13	4	Hansel and Gretel	mus-fan-c AYC	—	—	4	Runaway Bus, The (British)
—	4	6	Heart of the Matter, The (British)	dr-c A	5	12	2	Sabrina
—	1	2	Heat Wave (British)	cri-mel A	—	3	2	Security Risk
1	6	2	Hello Elephant (Italian)	com A	—	5	7	Shanghai Story, The
1	3	—	Hell's Gate (Japanese)	dr-c A	1	4	9	Shield for Murder
—	3	2	Hell's Outpost	mel A	1	6	1	Sign of the Pagan
3	12	3	Her Twelve Men	com-c AYC	—	4	6	Silver Chalice, The
—	6	—	High and Dry (British)	com AYC	—	—	8	Sitting Bull
—	1	11	Holiday for Henrietta (French)	com A	1	6	3	Six Bridges to Cross
—	11	4	Human Desire	cri-mel A	10	3	2	Sleeping Tiger, The (British)
1	8	1	Human Jungle, The	cri-mel A	—	4	—	Snow Creature
—	2	6	Hunters of the Deep	doc-c A	—	9	2	So This is Paris
2	3	—	Illicit Interlude (Swedish)	dr A	—	11	7	Souls in Conflict
—	3	1	Immortal City, The	doc-c AYC	—	—	4	Star is Born, A
—	—	—	Intruder, The (British)	war-dr A	—	1	—	Steel Cage, The
—	—	4	Jail Bait	cri-mel A	—	2	—	Suddenly
1	3	1	Jazz Dance	doc AYC	—	—	—	Sunderin (German)
—	9	—	Jesse James' Women	mus-wes-c A	5	4	5	Target Earth
—	3	1	Jupiter's Darling	mus-com-c A	—	2	2	Ten Wanted Men
—	2	1	Karamoja	doc-c A	—	1	—	Texas Bad Man
—	3	8	Khyber Patrol	adv-c AYC	—	6	4	Theodora, Slave Empress (French-Italian)
—	—	3	Killer Leopard	mel AYC	—	2	13	There's No Business Like Show Business
1	7	8	King Richard and the Crusaders	hist-mel-c A	2	6	—	They Rode West
1	10	4	Last Time I Saw Paris, The	dr-c A	2	7	—	This Is My Love
—	2	8	Law vs. Billy the Kid, The	wes-c A	—	6	6	This is Your Army
—	1	4	Lawless Rider, The	wes AYC	—	6	5	Three for the Show
—	3	1	Life in the Balance, A	mel A	—	7	6	Three Hours to Kill
5	9	2	Little Kidnappers, The (British)	dr A	—	3	5	Three Ring Circus
—	2	1	Littlest Outlaw, The	dr-c A	—	2	—	Three Stops to Murder (British)
—	6	1	Long Gray Line, The	dr-c AYC	—	—	—	Thunder Pass
—	1	2	Long John Silver	adv-c A	—	3	6	Tobor, the Great
—	8	4	Lovers, Happy Lovers (British)	dr A	—	5	3	Tonight's the Night (British)
—	6	8	Malta Story (British)	war-dr AYC	6	5	12	Track of the Cat
—	3	1	Mambo (Italian)	mus-dr A	—	3	2	Trouble in Store (British)
—	—	3	Many Rivers to Cross	mel-c A	—	2	4	Trouble in the Glen (British)
—	4	4	Masterson of Kansas	wes-c AYC	—	—	2	True and the False, The (Swedish)
—	2	3	Mexican Bus Ride	dr A	2	8	1	dr A
—	6	7	Naked Alibi	cri-mel A	1	5	1	20,000 Leagues Under the Sea
—	2	2	One Summer of Happiness (Swedish)	dr A	1	7	6	adv-c AYC
—	8	1	Operation Manhunt	mys-mel AYC	10	8	3	Twist of Fate
1	3	1	Othello	dr A	—	1	—	mys-mel A
—	2	5	Other Woman, The	mel A	1	7	3	wes A
—	3	5	Outlaw's Daughter, The	wes-c A	1	8	1	Two Guns and a Badge
—	3	—	Paid to Kill (British)	mys-mel A	—	1	8	Ugetsu (Japanese)
—	6	2	Paris Incident (French)	dr A	2	6	9	dr A
—	1	13	Passion	mel-c A	—	1	1	Unchained
—	—	3	Phantom Stallion	wes AYC	—	—	1	soc-dr A
1	9	7	Phifft	com A	1	8	3	Underwater!
—	4	3	Port of Hell	mel A	4	6	1	mel-c A
1	7	3	Prince of Players	biog-c A	—	4	8	Unholy Four, The (British)
—	4	7	Private Hell 36	mel A	—	4	—	mys-mel A
—	9	6	Pushover, The	cri-mel A	2	10	9	Valley of the Kings
2	5	1	Quest for the Lost City	doc-c AYC	—	3	10	mel-c A
—	2	1	Racers, The	mel-c A	—	2	9	Vanishing Prairie, The
1	7	5	Raid, The	war-mel-c AYC	—	3	2	doc-c AYC
12	6	—	Rear Window	mys-mel-c A	—	—	2	Varietease
—	5	3	Return from the Sea	war-rom AYC	1	7	3	Vera Cruz
—	3	5	Ricochet Romance	com AYC	—	1	4	mel-c A
—	—	—			—	2	4	Violent Men, The
—	—	—			—	3	3	mel-c A
—	—	—			—	—	3	Voice of Silence, The (Italian)
—	—	—			2	5	dr A	
—	—	—			—	2	5	Weak and the Wicked, The (British)
—	—	—			—	4	—	soc-dr A
—	—	—			1	8	4	Welcome the Queen
—	—	—			4	6	5	doc-c AYC
—	—	—			6	6	6	West of Zanzibar (British)
—	—	—			—	1	7	mel-c AYC
—	—	—			6	1	6	White Christmas
—	—	—			—	4	6	mus-com-c AYC
—	—	—			6	1	6	White Fire (British)
—	—	—			—	4	4	mel A
—	—	—			4	4	4	White Orchid, The
—	—	—			—	4	4	adv-c A
—	—	—			4	5	4	Woman's Angle, The (British)
—	—	—			—	5	4	dr A
—	—	—			5	5	4	Woman's World
—	—	—			—	3	4	dr-c A
—	—	—			3	3	4	Women's Prison
—	—	—			—	2	2	soc-dr A
—	—	—			2	—	2	World Dances, The
—	—	—			—	—	2	mus-doc-c AYC
—	—	—			—	7	7	Yellow Mountain, The
—	—	—			—	3	1	wes-c A
—	—	—			—	1	—	You Know What Sailors Are
—	—	—			—	—	—	com-c A
—	—	—			1	7	3	Young at Heart
—	—	—			—	1	2	mus-com-c A
—	—	—			—	—	—	mel AYC

The Consumers' Observation Post

(Continued from page 4)

that these products would have about the same effect for the purpose claimed as a well-known cough drop. The vigilance of the Fraud Division of the Post Office Department terminated the use of these misleading advertising claims in October 1954, about six months after they made their initial appearance.

* * *

THE NUMBER OF CHILDREN POISONED by eating lead paint is a problem that is worrying city health experts in various sections of the country where reported cases have been increasing in recent years. Lead is absorbed in the intestines and the blood stream deposits it in the bones and soft tissues. If the condition is not treated in time, the lead reaches and injures the brain. Symptoms are loss of appetite, vomiting, abdominal pains, pallor, irritability, and convulsions. The treatment for lead poisoning is painful and incomplete, and two New York University medical school departments are appealing for funds to advance a study of the problem. One proposal has been made that all paint cans be labeled so that paint containing lead can be clearly and surely identified in cities throughout the United States.

* * *

VEGETABLES COOKED BY THE SO-CALLED WATERLESS METHOD are often claimed to be more healthful than those cooked in a considerable amount of water. Various studies have been made indicating that certain vegetables retain a higher vitamin and mineral content when cooked in a minimum amount of water while other studies have shown that vegetables cooked in a medium amount of water were more palatable and just as nutritious as those cooked in larger or smaller amounts. In a study made by Virginia R. Charles and Frances O. Van Duyne, at the University of Illinois, asparagus, broccoli, Brussels sprouts, shredded and sliced cabbage, cauliflower, peas, and snap beans were cooked in half their weight of water in a tightly covered saucepan and the same vegetables were prepared in a waterless cooker. Neither method of cooking showed significant differences in the amounts of ascorbic acid retained by the drained vegetables. In appearance, color, and flavor, how-

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ever, the vegetables boiled in water in the tightly covered saucepan were rated generally superior to those prepared in the waterless cooker. The conclusion for the homemaker is that she may safely use whichever method produces the result her family likes best and she need not purchase a set of special utensils in order to make the most of vitamins in the vegetables cooked for dinner.

* * *

THE NEW, PERMANENTLY-PLEATED COTTONS have been advertised as washable but sometimes they are taken to the dry cleaner. Since there are a number of different types, the National Institute of Drycleaning made a study to see which can be dry cleaned and which wet cleaned satisfactorily. In some cases the so-called permanently-pleated cottons could not be repleated satisfactorily. With one type, N.I.D. found an effective technique was to pull the pleated garment through a nylon stocking with the foot cut off before giving it a dry cleaning run.

* * *

NEW GADGETS:

Ekco A & J Pry-Off Lid Flipper (Ekco Products Co., 1949 N. Cicero Ave., Chicago 39). 10c. This opener is designed for opening pry-off type lids of various kinds commonly found in the home kitchen. It was found very convenient in use and worked effectively on several types of tops. It was strong and sturdy. Directions were given on the back of the card on which the opener was mounted, with pictures that were clear and easy to follow.

French Waffler (Fred Stuart Corp., 246 Fifth Ave., New York 1). \$2.98, plus postage, from hardware and household supply stores. This device was a metal "waffler" designed to permit using bread to make French toast (not waffles) in a toaster. The directions cautioned against using regular waffle batter in the device. The directions for use called for careful trimming of slices of bread to fit the device and warned that the bread should be only lightly dipped in the egg and milk mixture. When directions were carefully followed, a satisfactory product resulted, but it required a lot of preparation and involved more work than making French toast the ordinary way in a skillet or waffles in a regular waffle iron. Furthermore, as one user pointed out, there would be a lot of bread crusts left or wasted if the device were used to make French toast for many people. It would be our opinion that this gadget is hardly to be considered a practical or efficient addition to the average home kitchen.

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Phonograph Records

BY WALTER F. GRUENINGER

Please Note: The first symbol applies to quality of interpretation, the second to fidelity of recording.

Bach: *Concerto No. 2 in E Major* and *No. 1 in A Minor*. Heifetz with the Los Angeles Philharmonic Orchestra under Wallenstein. RCA Victor LM 1818. \$3.98. Marvelous facility. But there's more Heifetz than Bach in many passages, little swells, slides, and some unusual tempi. Nevertheless, an interesting disk which violinists will discuss for years. Wide range, but dry recording which does not conceal Heifetz's breathing. **A** **A**

Beethoven: *Quartets Op. 18, Nos. 1 to 6*. Hungarian Quartet. 6 sides, Angel 3512-C. \$17.85. Early works by the master of this form. The performance sounds good until a direct comparison is made with the Budapest Quartet set (Columbia SL 172). Then one hears a performance that is artful, robust, beyond doubt superior; and so is the recording. **A** **B**

Beethoven: *Symphony No. 6 ("Pastorale")*. Members of the NBC Symphony under Stokowski. RCA Victor LM 1830. \$3.98. The storm in the lovely Pastorale gets a special Stokowski touch but otherwise the performance is orthodox. An "extra" is the *Sounds of Nature* talk and demonstration by Stokowski which you have to hear to believe—babbling brook, thunderclap played simultaneously with Beethoven's music! Toscanini on RCA Victor LM 1755 gets my vote for performance of this symphony, but his recording falls below Stokowski's. Best alternate, equal to Stokowski in performance and fidelity, is von Karajan on Angel 35080. Nearly equal to Toscanini in performance, but better recorded is Steinberg on Capitol S 8159. **A** **AA**

Brahms: *Concerto No. 1*. Rubinstein (piano) with the Chicago Symphony Orchestra under Reiner. RCA Victor LM 1831. \$3.98. Rubinstein plays this concerto less ponderously than one commonly hears. His recording, on direct comparison with those on Vox, HMV, Columbia (2), gets the palm for performance and fidelity. Solomon on Victor HMV 1042 runs a close second. **AA** **AA**

Handel: *Messiah*. Vyvyan, Procter, Maran, Brannigan, London Philharmonic Orchestra and Choir under Boult. 8 sides, London LLA 19. \$19.92. Seven LP recordings of this choral masterpiece to choose from! This one, with no peers for fidelity, is offered as "the complete recording from the original manuscript." It sounds very much like what you've probably heard before but perhaps more beautifully sung and played. Dissenters from tradition will vote for the Scherchen-Westminster Set WAL 308. Others may prefer the thorough, but colorless, Sargent-Angel Set 3510-C. But if I had to live with only one I would choose the London. Fortunately, I also have the Westminster. **AA** **AA**

Lalo: *Cello Concerto in D Minor* & **Bloch:** *Schelomo*. De Machula (cello) with the Hague Philharmonic Orchestra under van Otterloo. Epic LC 3072. \$4.98. Romantic works which demand passion and eloquence. The soloist has nearly enough of both, and he is well recorded. **A** **A**

Mahler: *Symphony No. 1*. Philharmonic-Symphony Orchestra of N. Y. under Walter. Columbia SL 218. \$4.98. There's no greater living interpreter of Mahler than his friend Bruno Walter. Under Walter, the Philharmonic gives a convincing performance of Mahler's *First*, and it is superbly recorded. **AA** **AA**

Meyerbeer: *Overtures and Orchestral Selections*. Paris Opera Orchestra under Sebastian. Urania URLP 7141. \$4.98. Excerpts from "Le Prophète," "L'Africaine," "Les Huguenots," "Dinorah." Light, charming melodic style widely admired a century ago. Unfortunately,

careless playing creeps in here and there suggesting insufficient rehearsal. **B** **A**

Tchaikovsky: *Violin Concerto*. David Oistrakh with the Saxon State Orchestra under Konwitschny. Decca DL 9755. \$5.85. Oistrakh makes more music of this concerto than most soloists, who use it mainly as a display piece. The slow movement is more lyric than generally heard; the third faster and more brilliant. Recording of the violin excellent, but orchestra is distant and tubby. Fifteen LP's are available, according to Schwann's informative catalog. Many are well played but not well recorded. Just about tops in evaluating performance and recording, is Ricci's disk—London LL 172. **AA** **A**

Torelli: *Twelve Concerti* (Op. 8). Barchet, Beh, Elsner, Pro Musica String Orchestra under Reinhardt. 6 sides, Vox Set DL 113. \$17.85. The most important work of this seldom heard 17th century composer presents the main features of the concerto form as used by Corelli, Handel, etc. Within that framework, played one per sitting, these pieces are enjoyable. Six are composed for two solo violins and strings, and four for solo violin and strings. The performers play straightforwardly, skillfully, if not with the authority and nuance expected of more famous musicians. Well balanced recording with satisfactory presence, reasonably wide range, rather piercing highs. **A** **A**

Vaughan Williams: *Sinfonia Antarctica*. London Philharmonic Choir and Orchestra under Boult. London LL 977. \$5.95. The work had its origin in the music of the film, "Scott of the Antarctic." It's bleak and epic. Among the usual aspects are wordless singing, wind machine, poetic introductions to movements spoken by John Gielgud. Marvelous performance and wide range recording. **AA** **AA**

Verdi: *Falstaff*. Valdengo, Madasi, Guerrera, Merriam, Elmo, NBC Symphony Orchestra under Toscanini. 6 sides, RCA Victor LM 6111. \$11.04. Comic chamber opera never popular though considered a great work by many. Taddei on Cetra 1207 brings more depth to the role of Falstaff than Valdengo on Victor but that's a minor point when Toscanini's masterful direction and the other members of the cast are considered. The broadcasts from which the disks were made goes back to April 1950 and the orchestra lacks the bloom and clarity prized nowadays. But the voices are satisfactorily recorded. Certainly anyone wanting a Falstaff should buy this one. **A** **B**

Callas *Portrays Puccini Heroines* (soprano). Angel 35195. \$5.95. Arias from "Manon Lescaut," "Madama Butterfly," "La Bohème," etc. The slow pulse of Callas' singing is disturbing at times. Yet her authority and rich timbre move me and I'm willing to tolerate the imperfections. Excellent reproduction. **A** **AA**

Music for a Rainy Night. Vic Schoen and His Orchestra. Decca DL 8081. \$4.85. "Come Rain or Come Shine," "I Cover the Waterfront," "Candlelight," and 9 other tunes of a popular nature. Vocal and instrumental featuring strings. Fairly well performed. Mood Music of which this is an example was once classified as Dinner Music. It's become big record business. **A** **A**

Sardanas. Cobla de la Principal de la Bisbal. Angel ANG 64007. \$3.95. Unique, flavorful disk of 9 numbers. The Sardana is a folk dance performed by Catalonians to a distinctive instrumental ensemble, here recorded. A three holed pipe, two tiple, two tenors, two fliscornes are included in the instrumental group. Good recording and first rate performance. **AA** **A**



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